Vol. 1015 Number 2

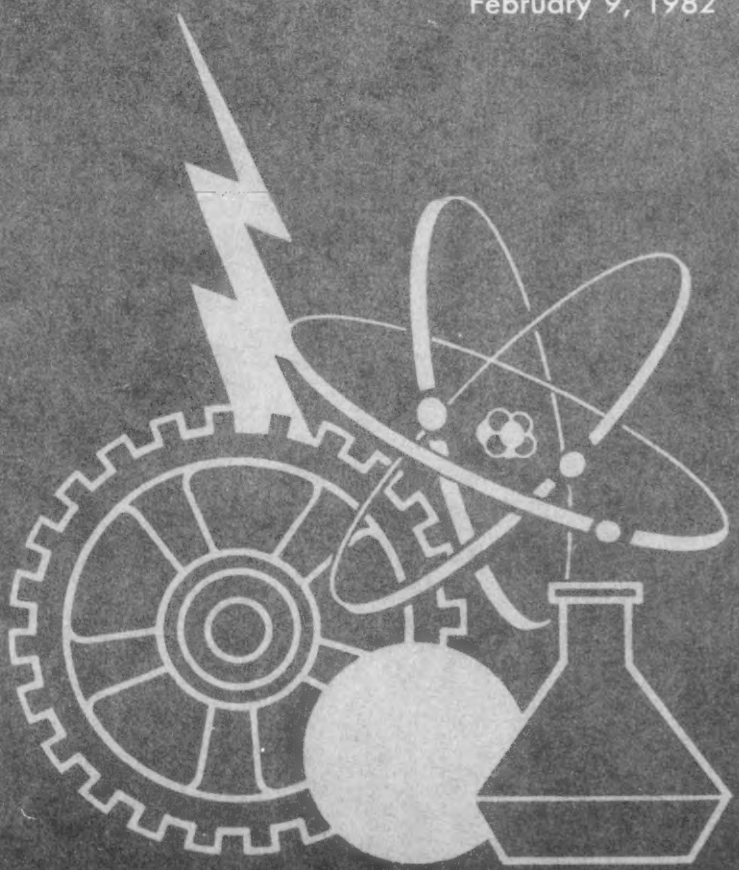
# OFFICIAL GAZETTE

of the

## UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

February 9, 1982



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

# OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

February 9, 1982 Volume 1015 Number 2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# PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty Information

For information concerning the PCT, consult Chapter 1800 of the Manual of Patent Examining Procedure and notices 90–95 in the consolidated listing of notices appearing in the Official Gazette of Jan. 6, 1981.

The PCT fees in effect after May 19, 1981 are as follows:

| | |
|---|---|
| Transmittal fee | $ 35.00 |
| Search fee | 300.00 |
| International Basic Fee (for the first 30 sheets of an international application) | 215.00 |
| Basic Supplemental Fee (for each sheet over 30) | 4.00 |
| International Designation Fee (for each State for which a national patent is sought, or group of States for which the same regional patent is sought) | 50.00 |

RENE D. TEGTMEYER,
*Assistant Commissioner for Patents.*

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### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

**3,890,543,** Re. S.N. 315,175, Filed Oct. 26, 1981, Cl. 361/56, LOW VOLTAGE SURGE PROTECTION NETWORK, Gaylord D. Jonassen, Owner of Record: *TII Industries, Inc., Copiague, N.Y.,* Attorney or Agent: Martin Sachs, Ex. Gp.: 212

**4,111,712,** Re. S.N. 315,340, Filed Oct. 26, 1981, Cl. 106/120, HIGH DENSITY ASBESTOS-FREE TOBERMORITE THERMAL INSULATION CONTAINING WOLLASTONITE, Walter G. Pusch, Owner of Record: *Johns-Manville Corp., Jefferson Colo.,* Attorney or Agent: Robert M. Krome, et al., Ex. Gp.: 142

**4,172,963,** Re. S.N. 316,010, Filed Oct. 28, 1981, Cl. 178/22, CHECKER AND AUTOMATIC SYNCHRONIZER FOR CODING EQUIPMENT, Harold P. Belcher, Owner of Record: *A.C.F. Industries, Inc., New York, N.Y.* Attorney or Agent: Eugene N. Riddle, Ex. Gp.: 222

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### REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

**3,340,800,** Reexam. No. 90/000,135, Requested: Jan. 4, 1982, Cl. 101/56, DUAL ROLLER PLATENS IN ADDRESS PRINTING MACHINES, John H. Gruver, et al., Owner of Record: *Addressograph Multigraph Corp., Chicago, Ill.,* Attorney or Agent: Robert Curfiss, Ex. Gp.: 330, Requester: Edward S. Irons, Washington, D.C.

**3,802,788,** Reexam. No. 90/000,137, Requested: Jan. 7, 1982, Cl. 401/94, STYLOGRAPHIC PEN CAP, William E. Danjczek, Owner of Record: *Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.,* Attorney or Agent: David H. Semmes, Ex. Gp.: 337, Requester: Alvin & Co., Inc., Bloomfield, Conn.

**4,295,004,** Reexam. No. 90/000,133, Requested: Dec. 28, 1981, Cl. 174/87, WIRE CONNECTOR, William C. Dauser, Jr., Owner of Record: *Lloyd A. Heneveld, Dauser Trust IV,* Attorney or Agent: Price, Heneveld, et al., Ex. Gp.: 210, Requester: Lloyd A. Heneveld, Grand Rapids, Mich.

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### COMMISSIONER ORDERED REEXAMINATION

Notice under 37 CFR 1.11(c). The orders for reexamination listed below are open to inspection by the general public in the indicated Examining Group. Copies of the Orders and other related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed. 37 CFR 1.248(a)(5) and 1.525(b).

**4,251,727,** Reexam. No. 90/000,136, Ordered Jan. 11, 1982, Cl. 250/343, GAS DETECTION, David R. Piercy, Owner of Record: *J. & S. Sieger, Ltd., Dorset, England,* Attorney or Agent: Birch, Steward, et al., Ex. Gp.: 250

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### Closing of Patent and Trademark Office on Thursday, Jan. 14, 1982

In view of the fact that Federal and District of Columbia government offices in the Washington, D.C. metropolitan area, including the Patent and Trademark Office, were officially closed on Jan. 14, 1982, the Patent and Trademark Office will consider Jan. 14, 1982, a "holiday within the District of Columbia" under 35 U.S.C. §21. Any action or fee due that day will be considered as timely for the purposes of, e.g., 35 U.S.C. §§119, 133 and 151, if the action is taken, or fee paid, on Jan. 15, 1982.

GERALD J. MOSSINGHOFF,
*Commissioner of Patents and Trademarks.*

Jan. 15, 1982.

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### Compressed Work Week

The Office of Personnel Management has completed a study on compressed work schedules and has recommended that Congress enact permanent legislation authorizing use of alternative work schedules in the Federal Government. The authority for the program expires on Mar. 28, 1982.

The U.S. Patent and Trademark Office has been participating in this program, on an experimental basis, for nearly two years. Most of the Office's examiners and other employees are permitted to participate under one of two options:

1. 4/10 plan-Work ten hours four days a week and choose Monday, Wednesday, or Friday as a day off each week. The day selected can be changed only with supervisory approval.

2. 5/4-9 plan-Work nine hours for eight continuous days, eight hours on the ninth day, and choose Mon-

day, Wednesday, or Friday as a day off once every two weeks. Again, the day off can only be changed with supervisory approval.

All employees must be on duty Tuesdays and Thursdays.

The U.S. Patent and Trademark Office is interested in considering any comments or recommendations you may have about the program in order to make the proper decision concerning the continuation, revision, or termination of alternative work schedules should the Congress enact legislation authorizing its continuation.

Please send any comments or recommendations you may have, no later than Mar. 2, 1982, to:

Commissioner of Patents and Trademarks
U.S. Patent and Trademark Office
Washington, D.C. 20231

GERALD J. MOSSINGHOFF,
Jan. 21, 1982. *Commissioner of Patents and Trademarks.*

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**Public Access to Computerized Patent Search Data Bases.**

The PTO, in cooperation with Intellectual Property Owners, Inc. (IPO), has arranged for the placement of computer terminals in the Public Search room which access the Pergamon Video Patsearch System. This patent searching tool enables the computerized searching of front page and abstract data contained in all patents issued during the past eleven years. In addition, video searching of selected drawings in these patents in also available by computer search for display on viewing screens. The computer searching service is available to the general public in the Public Search Room for a fee related to the cost of each search. The new service was initiated on Dec. 4, 1981 in a ceremony attended by Senator Charles McC. Mathias, Jr., Commissioner Gerald Mossinghoff, and former Commissioner Donald Banner who is now president of IPO.

RICHARD J. SHAKMAN,
Dec. 8, 1981. *Assistant Commissioner for Administration.*

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**Government-Owned Inventions**
Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce

SN 6-294,096, Enhancement of Color Quality of Lumber During Drying. Filed Sept. 18, 1981 by the Dept. of Agriculture. Inventor: Howard Rosen.

SN 6-302,008, Process for Modifying Cellulosic Fabrics for Improved Heat Transfer Printing. Filed Sept. 15, 1981 by Dept. of Agriculture. Inventor: Eugene Blanchard.

SN 6-272,842, Zwitterion Compounds as Catalysts in Easy-Care Finishing. Filed by Dept. of Agriculture on June 12, 1981. Inventor: Robert M. Reinhardt.

SN 6-276,768, Bromine-Containing 2,4-Diaminotriazines. Filed June 24, 1981 by the Department of Agriculture. Inventor: Leon H. Chance.

SN 6-294,095, New Surface in Cellulosic Fibers by Use of Radiofrequency Plasma of Ammonia. Filed Aug. 19, 1981 by the Dept. of Agriculture. Inventor: Truman L. Ward.

SN 6-290,540, Method for Sampling Flying Insect Populations Using Low-Frequency Sound Detecting & Ranging in Conjunction with a Biologically Active Chemical/Pheromone. Filed Aug. 6, 1981 by Department of Agriculture. Inventor: D. E. Hendricks.

SN 6-308,350, Antimicrobial Glycolic Acid Derivatives. Filed Oct. 5, 1981 by the Department of Agriculture. Inventor: August V. Bailey.

SN 6-311,587, Apparatus for Continuous Injection of Chemically-Impregnated Filament. Filed Oct. 15, 1981 by the Department of Agriculture. Inventor: Jim E. Dale.

SN 6-308,743, Antimicrobial Glycolic Acid Derivatives. Filed by Department of Agriculture on Oct. 5, 1981. Inventor: August V. Bailey.

SN 6-311,702, Apparatus to Extract Dust and Fine Trash from Opened Cotton. Filed Oct. 15, 1981 by the Department of Agriculture. Inventor: Charles Shephard.

SN 6-302,007, Textile Finishing Agents from Reaction Products of Carbamates and Glutaraldehyde. Filed Sept. 15, 1981 by Dept. of Agriculture. Inventor: John G. Frick.

SN 6-294,203, Nondenaturing Zwitterionic Detergents for Membrane Biochemistry. Filed Aug. 26, 1980 by Dept. of Health and Human Services. Inventor: Leonard Hjelmeland.

SN 6-180,373, Nitroimidazoles of Low Toxicity and High Activity as Radio-sensitizers of Hypoxic Tumor Cells. Filed Aug. 2, 1980 by Dept. of Health & Human Services. Inventor: W. W. Lee.

# PATENT NOTICES

**Certificates of Correction for the Week of Feb. 9, 1982**

| | | | |
|---|---|---|---|
| PP. 4,793, | 4,275,958 | 4,293,029 | 4,298,816 |
| Re. 30,730 | 4,276,306 | 4,293,290 | 4,298,960 |
| Des. 259,059 | 4,277,597 | 4,293,354 | 4,298,962 |
| Des. 261,000 | 4,278,668 | 4,293,609 | 4,299,199 |
| Des. 261,496 | 4,279,731 | 4,293,628 | 4,299,401 |
| 4,070,462 | 4,279,922 | 4,293,711 | 4,299,464 |
| 4,165,208 | 4,281,167 | 4,293,712 | 4,299,510 |
| 4,180,626 | 4,281,233 | 4,293,741 | 4,299,544 |
| 4,190,723 | 4,282,072 | 4,293,875 | 4,299,565 |
| 4,193,933 | 4,282,192 | 4,294,284 | 4,299,651 |
| 4,195,667 | 4,282,839 | 4,294,386 | 4,299,696 |
| 4,197,827 | 4,283,278 | 4,294,491 | 4,299,809 |
| 4,223,778 | 4,284,697 | 4,294,730 | 4,299,822 |
| 4,224,516 | 4,285,122 | 4,294,733 | 4,299,833 |
| 4,230,397 | 4,285,331 | 4,294,822 | 4,299,854 |
| 4,232,812 | 4,285,836 | 4,294,847 | 4,299,929 |
| 4,237,924 | 4,285,935 | 4,294,895 | 4,299,976 |
| 4,239,465 | 4,286,547 | 4,294,978 | 4,300,030 |
| 4,244,729 | 4,287,466 | 4,295,491 | 4,300,104 |
| 4,251,236 | 4,287,872 | 4,295,569 | 4,300,474 |
| 4,251,267 | 4,288,560 | 4,295,686 | 4,300,800 |
| 4,255,660 | 4,288,583 | 4,295,985 | 4,300,844 |
| 4,255,667 | 4,288,606 | 4,296,033 | 4,300,938 |
| 4,258,077 | 4,289,022 | 4,296,173 | 4,301,054 |
| 4,259,720 | 4,289,558 | 4,296,193 | 4,301,314 |
| 4,261,985 | 4,290,097 | 4,296,246 | 4,301,474 |
| 4,262,542 | 4,290,495 | 4,296,472 | 4,301,501 |
| 4,263,323 | 4,290,734 | 4,297,187 | 4,301,505 |
| 4,265,911 | 4,290,766 | 4,297,475 | 4,301,906 |
| 4,265,965 | 4,291,173 | 4,297,645 | 4,302,126 |
| 4,269,932 | 4,291,323 | 4,297,938 | 4,302,163 |
| 4,270,608 | 4,291,783 | 4,298,036 | 4,302,551 |
| 4,270,657 | 4,291,859 | 4,298,231 | 4,302,630 |
| 4,271,411 | 4,292,156 | 4,298,287 | 4,302,653 |
| 4,271,424 | 4,292,208 | 4,298,307 | 4,303,095 |
| 4,273,935 | 4,292,439 | 4,298,424 | 4,303,221 |
| 4,274,954 | 4,292,785 | 4,298,509 | 4,303,619 |
| 4,275,174 | 4,292,898 | 4,298,561 | |

## Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

| *State* | *Name of Library* | *Telephone Contact* |
|---|---|---|
| Alabama | Birmingham Public Library | (205) 254-2555 |
| Arizona | Tempe: Science Library, Arizona State University | (602) 965-7607 |
| California | Los Angeles Public Library | (213) 626-7555 Ext. 273 |
| | Sacramento: California State Library | (916) 322-4572 |
| | Sunnyvale: Patent Information Clearinghouse* | (408) 738-5580 |
| Colorado | Denver Public Library | (303) 573-5152 Ext. 222 |
| Delaware | Newark: University of Delaware | (302) 738-2238 |
| Georgia | Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology | (404) 894-4519 |
| Illinois | Chicago Public Library | (312) 269-2814 |
| Louisiana | Baton Rouge: Troy H. Middleton Library, Louisiana State University | (504) 388-2570 |
| Massachusetts | Boston Public Library | (617) 536-5400 Ext. 265 |
| Michigan | Detroit Public Library | (313) 833-1450 |
| Minnesota | Minneapolis Public Library & Information Center | (612) 372-6552 |
| Missouri | Kansas City: Linda Hall Library | (816) 363-4600 |
| | St. Louis Public Library | (314) 241-2288 Ext. 214, 215 |
| Nebraska | Lincoln: University of Nebraska-Lincoln, Engineering Library | (402) 472-3411 |
| New Hampshire | Durham: University of New Hampshire Library | (603) 862-1777 |
| New Jersey | Newark Public Library | (201) 733-7814 |
| New York | Albany: New York State Library | (518) 474-5125 |
| | Buffalo and Erie County Public Library | (716) 856-7525 Ext. 267 |
| | New York Public Library (The Research Libraries) | (212) 930-0850 |
| North Carolina | Raleigh: D. H. Hill Library, N.C. State University | (919) 737-3280 |
| Ohio | Cincinnati & Hamilton County, Public Library of | (513) 369-6936 |
| | Cleveland Public Library | (216) 623-2870 |
| | Columbus: Ohio State University Libraries | (614) 422-6286 |
| | Toledo/Lucas County Public Library | (419) 255-7055 Ext. 212 |
| Oklahoma | Stillwater: Oklahoma State University Library | (405) 624-6546 |
| Pennsylvania | Philadelphia: Franklin Institute Library | (215) 448-1321** |
| | Pittsburgh: Carnegie Library of Pittsburgh | (412) 622-3138 |
| | University Park: Pattee Library, Pennsylvania State University | (814) 865-4861 |
| Rhode Island | Providence Public Library | (401) 521-7722 Ext. 226 |
| South Carolina | Charleston: Medical University of South Carolina | (803) 792-2372 |
| Tennessee | Memphis & Shelby County Public Library and Information Center | (901) 528-2957 |
| Texas | Dallas Public Library | (214) 748-9071 |
| | Houston: The Fondren Library, Rice University | (713) 527-8101 Ext. 2587 |
| Washington | Seattle: Engineering Library, University of Washington | (206) 543-0740 |
| Wisconsin | Madison: Kurt F. Wendt Engineering Library, University of Wisconsin | (608) 262-6845 |
| | Milwaukee Public Library | (414) 278-3043 |

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

# PATENT EXAMINING CORPS

**RENE D. TEGTMEYER, Assistant Commissioner**

**WILLIAM FELDMAN, Deputy Assistant Commissioner**

**CONDITION OF PATENT APPLICATIONS AS OF December 26, 1981**

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices. | 6-23-80 |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides. | 12-06-79 |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions. | 3-02-81 |
| COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography. | 11-14-80 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. | 10-06-80 |
| **ELECTRICAL EXAMINING GROUPS** | |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales. | 5-20-80 |
| SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries. | 6-19-80 |
| INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—VACANT ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts. | 8-07-80 |
| RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling. | 12-07-79 |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring. | 10-02-79 |
| DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts. | 4-02-80 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment. | 7-01-80 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter. | 6-17-80 |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination. | 3-17-80 |
| HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication. | 10-22-79 |
| GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches. | 3-17-80 |

**Expiration of patents**: The patents within the range of numbers indicated below expire during December 1981, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,158,867 to 3,163,864, inclusive

Plant Patents ..... Numbers 2,455 to 2,464 inclusive

# REISSUES

## FEBRUARY 9, 1982

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

**Re. 30,861**

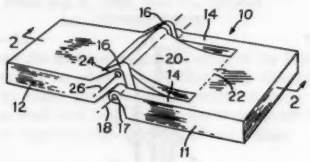
**BIASED HINGES**

**Alois A. Krawagna, Toronto, Canada, assignor to Westhem Corporation Limited, Toronto, Canada**

**Original No. 3,720,979, dated Mar. 20, 1973, Ser. No. 744,268, Jun. 17, 1968. Continuation-in-part of Ser. No. 689,390, Dec. 11, 1967. Application for reissue Aug. 29, 1979, Ser. No. 70,869**

**Int. Cl.³ E05D *7/00***

**U.S. Cl. 16—293** **15 Claims**




*6. A snap-hinge comprising:*

*a first hinge member,*

*a second hinge member hinged to said first hinge member about a first hinge line,*

*a curved resilient connecting link of uniform cross-section, the link being joined at one end integrally to said first hinge member at a second hinge line and joined at the other end integrally to said second hinge member at a third hinge line, the link being curved and said ends of substantially uniform cross-section intermediate its ends, the resilient connection link tending resiliently to maintain its two ends apart at a given spacing, said second hinge line being spaced at an invariable distance from said first hinge line, said third hinge line being spaced at an invariable distance from said first hinge line, the snap-hinge having a first position and a second position, in each of which stress in the connecting link is at a minimum, the snap-hinge being at rest in each of said positions, a small departure from either of which increases the stress in the connecting link, which tends to restore the snap-hinge to the respective position, the connecting link being capable of resilient deformation between its one end and its other end when the distance between the ends changes, the snap-hinge being adapted to articulate between said first-mentioned position and said second position in such a way that the connecting link is resiliently deformed in positions intermediate said first-mentioned position and said second position when the distance between the ends of the link changes, the maximum deformation of said connecting link representing a state of unstable equilibrium for the snap-hinge, departure from which in either direction causes said connecting link to urge the snap-hinge further in that direction to return the snap-hinge to one of said positions.*

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**Re. 30,862**

**REJECTION-TYPE FUSE CLIP**

**Stephen A. Mrenna, Beaver, and Zelko J. Kruzic, New Brighton, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Original No. 3,984,801, dated Oct. 5, 1976, Ser. No. 617,618, Sep. 29, 1975. Application for reissue Jun. 12, 1978, Ser. No. 914,464**

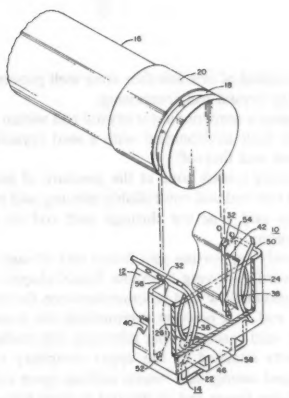
**Int. Cl.³ H01C *1/02***

**U.S. Cl. 339—258 R** **3 Claims**

2. [The fuse clip according to claim 1 wherein said rejection member includes] *A fuse clip for use with cylindrical cartridge fuses of the type having two end terminals, one of said end terminals having an annular groove therein wherein the diameter of said end at the location of said groove is smaller than the diameter of the remainder of said terminal, said fuse clip permitting the insertion of only those end terminals having said annular groove, said fuse clip comprising:*

*a main body member including spaced, generally parallel flexible clamping arms having opposing contact surfaces for engaging opposite sides of said end terminal, said clamping arms having aligned slots therein, said body member including a base connecting said clamping arms; and*

*a rejection member comprising a back portion and a pair of spaced, generally parallel rigid holding arms extending outwardly from said back portion in a generally C-shaped configuration, each of said holding arms having an inward extension extending toward the other of said holding arms and generally parallel to said back portion, said inward extensions being positioned in said clamping arm slots, said inward extensions being spaced apart a distance greater than the diameter of said end terminal at the location of said annular groove and a distance less than the diameter of the remainder of said end terminal, whereby said cartridge fuse can be inserted into said fuse clip when said annular groove is positioned between said inward extensions, said rejection member including* a mounting member extending outwardly from said back portion generally at right angles to said back portion and said holding arms, said mounting member being positioned adjacent to, and secured to, said main body member base.



Re. 30,863

## METHOD FOR CRUCIBLE-FREE ZONE MEETING OF SEMICONDUCTOR CRYSTAL RODS

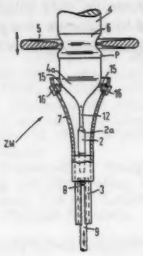
Wolfgang Keller, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Original No. 3,996,096, dated Dec. 7, 1976, Ser. No. 638,261, Dec. 8, 1975. Division of Ser. No. 580,585, May 27, 1975, Pat. No. 3,988,197, which is a division of Ser. No. 525,641, Nov. 20, 1974, Pat. No. 3,923,468. Application for reissue Mar. 17, 1977, Ser. No. 778,587

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1973, 2358300

Int. Cl.[3] C30B *13/30*

U.S. Cl. 156—620 2 Claims



1. A method of crucible-free zone melt processing of a semiconductor crystal rod comprising:

arranging a semiconductor crystal rod within a crucible-free zone melt environment with a seed crystal attached to a lower end thereof;

generating a melt zone at the juncture of said seed crystal and said rod and controllably moving said melt zone away from said juncture through said rod to a select point thereon;

uniformly supporting said lower end of said rod by axially upwardly moving a hollow funnel-shaped casing from a position below said juncture between the seed crystal and the rod to a position surrounding the lower end of said rod, said casing having relatively low melting pure metal inserts attached at the upper periphery of said funnel-shaped casing, said inserts melting upon contact with the still-hot lower end of the rod as such rod is traversed by said melt zone so as to form a eutectic mixture with the material of said rod and then solidifying to form a solid connection between said casing and the lower end of said rod; and

controllably moving said melt zone from said select point through the remaining portion of said rod.

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Re. 30,864

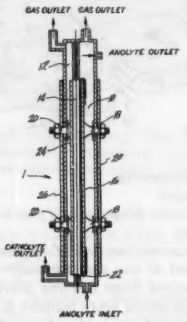
## PROCESS FOR ELECTROLYSIS IN A MEMBRANE CELL EMPLOYING PRESSURE ACTUATED UNIFORM SPACING

David D. Justice, Cleveland, Tenn.; Byung K. Ahn, Pittsburgh, Pa., and Ronald L. Dotson, Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Original No. 4,105,514, dated Aug. 8, 1978, Ser. No. 810,135, Jun. 27, 1977. Application for reissue Aug. 7, 1979, Ser. No. 64,651

Int. Cl.[3] C25B *1/34, 13/00*

U.S. Cl. 204—98 27 Claims




1. A process for electrolysis in an electrolytic cell comprising an anode compartment containing a foraminous anode and an anolyte solution, a cathode compartment containing a foraminous metal cathode and a catholyte solution, a hydraulically impermeable membrane separating said anode compartment from said cathode compartment, spacing means interposed between said anode and said hydraulically impermeable membrane to space apart said anode from said hydraulically impermeable membrane, wherein the process comprises providing a positive pressure differential between said cathode compartment and said anode compartment to maintain contact between said hydraulically impermeable membrane and said spacing means to provide uniform spacing between said anode and said hydraulically impermeable membrane, said positive differential pressure being sufficient to maintain said membrane against said spacing means.

# PLANT PATENTS

## GRANTED FEBRUARY 9, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

**4,822**

### ROSE PLANT

**Dorothy J. S. Bailey, Bakersfield, Calif., assignor to San Joaquin Rose Co., McFarland, Calif.**

**Filed Sep. 9, 1980, Ser. No. 185,448**

**Int. Cl.[3] A01H** *5/00*

**U.S. Cl. Plt.—22** **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class, substantially as shown and described, characterized particularly by many petaled flowers borne in large sprays which begin as shell pink buds and mature to signal red blooms displayed on a vigorous plant with abundant foliage.

**4,823**

### PLUM TREE

**Frederic W. Anderson, 826 W. 22nd St., Merced, Calif. 95340**

**Filed Sep. 22, 1980, Ser. No. 189,208**

**Int. Cl.[3] A01H** *5/03*

**U.S. Cl. Plt.—38** **1 Claim**

1. A new and distinct variety of plum tree, substantially as illustrated and described, characterized, in comparison to the Red Beaut, by more consistent production of fruit, and which fruit is slightly larger in size and ripens about one week later.

# PATENTS

## GRANTED FEB. 9, 1982

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| 501–088 | 4,314,852 |
| 376–128 | 4,314,879 |
| 376–146 | 4,314,880 |
| 376–245 | 4,314,881 |
| 376–235 | 4,314,882 |
| 376–381 | 4,314,883 |
| 376–441 | 4,314,884 |
| 376–327 | 4,314,885 |
| 372–035 | 4,315,225 |
| 372–045 | 4,315,226 |

# PATENTS

## GRANTED FEBRUARY 9, 1982

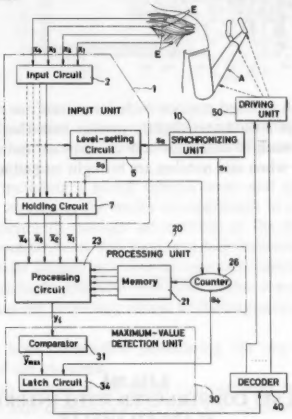
## GENERAL AND MECHANICAL

**4,314,379**

### APPARATUS FOR DISCRIMINATION OF MYOELECTRIC POTENTIAL PATTERNS

**Kazuo Tanie, Yokohama, and Susumu Tachi, Tokyo, both of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan**

**Filed Feb. 20, 1980, Ser. No. 123,096**
**Claims priority, application Japan, Feb. 26, 1979, 54-21645**
**Int. Cl.³ A61F *1/00***
**U.S. Cl. 3—1.1** **7 Claims**




**1**. An apparatus for the discrimination of myoelectric potential patterns obtained by m myoelectric potential signals derived from motions of muscles of a body part and transmitted by a plurality of myoelectrodes fastened to the muscles at a like plurality of positions, the myoelectric potential patterns having n categories each one of which is assigned to a different motion produced by the muscles, the apparatus comprising an input unit for rectifying and smoothing the myoelectric

potential signals transmitted by the myoelectrodes, means for summing said potential signals and for comparing the sum of the transmitted myoelectric potential signals with a preset reference level and, when the sum exceeds the reference level, forwarding the individual myoelectric potential signals through an output of the input unit;

a processing unit formed of a group of memories having stored therein the weight coefficients determined on the basis of the average myoelectric potential patterns obtained in advance with prescribed modes of motions of the muscles and a processing circuit for performing one by one arithmetic operations on the actual myoelectric potential signals (s) received from the output of said input unit, wherein denotes actual input patterns, and the weight coefficients (a) from the memories in accordance with linear discriminant functions expressed by the following formulas to issue values (y) successively:

$$y_1 = a_{1,1}x_1^{\alpha} + a_{1,2}x_2^{\alpha} + \ldots + a_{1,m}x_m^{\alpha} + a_{1,m+1}$$
$$y_2 = a_{2,1}x_1^{\alpha} + a_{2,2}x_2^{\alpha} + \ldots + a_{2,m}x_m^{\alpha} + a_{2,m+1}$$
$$\vdots$$
$$y_n = a_{n,1}x_1^{\alpha} + a_{n,2}x_2^{\alpha} + \ldots + a_{n,m}x_{m\alpha} + a_{n,m+1}$$

wherein n is the number of the categories of the modes of the motions and m is the number of the myoelectric potential signals;

a maximum-value detection unit for latching the signal of the maximum value singled out of the values received from the processing unit and issuing, as output, the signal of the category number corresponding to the maximum-value signal; and

a synchronizing unit for synchronizing the operation of the input unit, processing unit and maximum-value detection unit.

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**4,314,380**

### ARTIFICIAL BONE

**Teruo Miyata; Taichiro Akiyama, both of Tokyo, and Masayasu Furuse, Sagamihara, all of Japan, assignors to Koken Co., Ltd., Tokyo, Japan**

**Filed Sep. 26, 1980, Ser. No. 191,258**
**Int. Cl.³ A61F *1/24, 1/00***
**U.S. Cl. 3—1.9** **13 Claims**

**1**. As an article of manufacture, an artificial bone comprising a core of porous, organic-free hydroxyapatite obtained from chemically-treated, burned, baked animal bone, said hydroxyapatite being impregnated and coated with atelocollagen.

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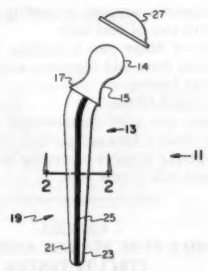
**4,314,381**

### HIP JOINT PROSTHESIS

**James B. Koeneman, Erie, Pa., assignor to Lord Corporation, Erie, Pa.**

**Filed Jun. 25, 1980, Ser. No. 162,845**
**Int. Cl.³ A61F *1/24***
**U.S. Cl. 3—1.912** **15 Claims**



**1**. A joint prosthesis for replacement of the hip joint in a human body comprising:

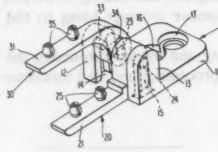
an acetabulum prosthesis formed in a hemispherical cup for attachment to the acetabulum cavity of the pelvis; and

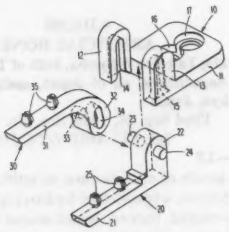
a femoral head prosthesis having a sphere at one end moveable within said cup of said acetabulum prosthesis, and having a stem at the other end shaped for insertion into the medullary canal of the femur, said stem being formed of at least one section of resilient elastomeric material disposed between and attaching to at least two spaced apart outer sections of rigid material, said section of resilient elastomeric material having at least a portion of its volume located as an innermost core part of said stem.

## 4,314,382
## HINGE FOR TOILET SEAT AND LID

Milton Ginsburg, 1201 Sandringham Rd., Bala Cynwyd, Pa. 19004, and William J. Lux, Holland, Pa., assignors to Milton Ginsburg, Bala Cynwyd, Pa.

Filed Aug. 8, 1980, Ser. No. 176,285
Int. Cl.[3] A47K *13/12*
U.S. Cl. 4—236 3 Claims





1. A hinge for a toilet seat and lid, said hinge comprising:
a. a bowl leaf;
b. a seat leaf;
c. a lid leaf;
d. said bowl leaf having
d-1 a base;
d-2 a pair of spaced-apart socket portions extending upwardly from the forward end of said base;
e. said seat leaf having
e-1 an elongated base;
e-2 at least two split compressible studs projecting upwardly from a forward end of said base;
e-3 a hinge-pin support extending upwardly from the rearward end of said base;
e-4 a pair of hinge pins extending laterally in opposing directions from said hinge-pin support;
f. said lid leaf having;
f-1 an elongated base;
f-2 at least two split compressible studs projecting upwardly from a forward portion of said base;
f-3 a hinge-pin support extending downwardly from the rearward end of said base.

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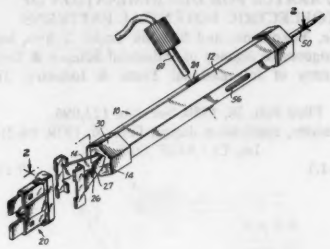
## 4,314,383
## AUTOMOBILE FUSE PULLER AND COMBINATION CIRCUIT TESTER

Harry Epstein, Seaford, N.Y., assignor to Kastar, Inc., Bellrose, N.Y.

Filed Feb. 25, 1980, Ser. No. 123,928
Int. Cl.[3] B25F *1/00*; B25B *27/14*; G01R *19/16*
U.S. Cl. 7—170 7 Claims

1. An improved fuse pulling apparatus comprising an elongated housing, a pair of complementary jaws slidably mounted within said housing and extending partially outwardly thereof, means for urging the jaws towards one another as the jaws are moved into the housing, means for urging the jaws to rotate as the jaws are moved into the housing, and means for locking the jaws in a closed position such that forward movement without manual rotation of the device would cause the jaws to lock onto a fuse, said means for urging the jaws toward one another includes a plate having a substantially rectangular opening through which said pair of complementary jaws are disposed, said means for urging the jaws to rotate include a cap disposed over said plate having an aperture through which said complementary jaws are disposed, and portions which extend inwardly of the opening in said plate, and said means for locking



the jaws in a closed position includes at least one notch in each said jaw of a thickness slightly greater than that of said plate whereby each of said jaws may be disposed onto the edge of said plate when said notches are brought into adjacent position therewith.

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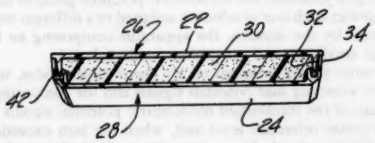
## 4,314,384
## WATER SKI CONSTRUCTED WITH INTERLOCKING FLANGED SHELLS

Harold R. Weinhaus, Southfield, Mich., assignor to The Budd Company, Troy, Mich.

Filed Aug. 8, 1980, Ser. No. 176,612
Int. Cl.[3] A63C *5/00*
U.S. Cl. 9—310 A 8 Claims



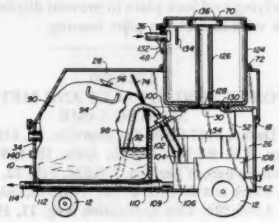

1. A ski comprising: a rigid molded upper shell forming a deck portion having a continuous depending flange adjacent the perimeter for reinforcing the rigidity of said upper shell and integral therewith, a rigid molded lower shell having a bottom portion having a first continuous upwardly projecting flange extending around the entire perimeter of said lower shell complementary to the surface of said depending flange for reinforcing the rigidity of said lower shell and said first flange having an outer surface coextensive with the outer edge of said upper shell, an adhesive between said depending and said first upwardly projecting flanges around the entire perimeter of said shells to bond said shells together with said deck and bottom portions in spaced relationship to each other and said lower shell having a second upwardly projecting flange spaced from said first upwardly projecting flange and forming a trough therewith, said trough being spaced from said depending flange for receiving excess adhesive from between said depending flange and said first upwardly projecting flange and preventing the excess adhesive from flowing into the main cavity between said shells.

4,314,385

## CARPET CLEANING SYSTEM

James M. Wimsatt, and Patrick E. Lynch, Jr., both of Carson City, Nev., assignors to WLN Products, Reno, Nev.

Filed Jun. 26, 1980, Ser. No. 163,036
Int. Cl.³ A47L 7/00
U.S. Cl. 15—321 12 Claims



1. A carpet cleaning system convertible between a vacuuming configuration and a liquid cleaning configuration, said system comprising:

a canister including a motor compartment and a chamber partially overlying the motor compartment in communication therewith through an aperture in the top of the motor compartment and having a bag-receiving cavity, said canister further including an upwardly opening hatch for access to the chamber above the motor compartment, and means for providing access to the bag-receiving cavity;

a vacuum hose connection penetrating the bag-receiving cavity of the chamber;

an air pump located in the motor compartment and having an input side communicating with the chamber through the aperture in the top of the motor compartment;

a liquid pump located in the motor compartment and having an input side communicating with an input fitting inside the chamber and an output side communicating with an output fitting on the exterior of the canister;

an air tight dome engaged with the hatch when the system is in the vacuuming configuration;

a recovery tank including a liquid cleaning hose connection penetrating the tank and a central vertical pipe communicating with a hole in the base of the tank, said tank being inserted in the hatch when the system is in the liquid cleaning configuration so that the hole is aligned with the aperture in the top of the motor compartment;

a filter bag inserted in the bag-receiving cavity when the system is in the vacuuming configuration, said filter bag being connected to the vacuuming hose connection;

a solution bag inserted to the bag-receiving cavity when the system is in the liquid cleaning configuration, said solution bag being connected to the input fitting of the liquid pump;

a cleaning solution dispensing tube attached to the output fitting of the liquid pump when the system is in the liquid cleaning configuration to dispense a cleaning solution pumped from the solution bag; and

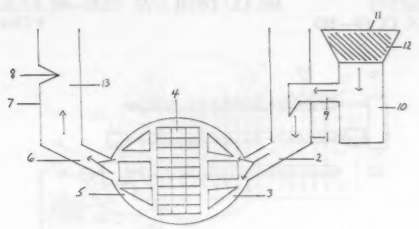
a hose and wand assembly attached to the vacuuming hose connection when the system is in the vacuuming configuration so that the air pump draws air through the hose and wand into the filter bag and out through the walls of the bag to provide a vacuuming action, said hose and wand assembly being attached to the liquid cleaning hose connection in the liquid cleaning configuration so that air drawn from the tank through the vertical pipe by the air pump provides suction to draw the dispensed cleaning solution through the hose and wand and into the recovery tank.

4,314,386

## METHOD OF MEAT TENDERIZING

Thomas C. Easthope, 41 Kootenay Crescent, Scarborough, Ontario, and Robert R. Martin, 608 Brock St., South, Whitby, Ontario, both of Canada

Filed Nov. 20, 1978, Ser. No. 957,431
Int. Cl.³ A22C 9/00
U.S. Cl. 17—51 1 Claim



1. A method of tenderizing meat in the form of a carcass in the state of primary flacidity, free of rigor mortis and free of any form of mutilation, other than the point of injection, comprising the steps of injecting wine under pressure into a major artery while blood in the arteries and veins is allowed to drain via a major vein, after an intra-vascular pressure has been obtaned, under pressure of the injected wine thus replacing blood in all blood vessels of the animal's carcass, resulting in a complete penetration of wine in all body areas previously supplied by blood and then allowing the carcass to stand at 38° F. until the wine has reacted on the tissue resulting in a thorough tenderizing of the meat.

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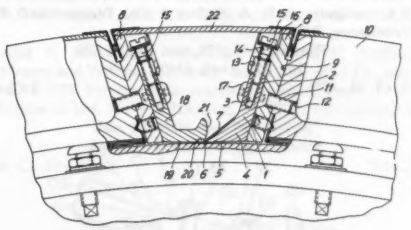
4,314,387

## DIRT SEPARATOR

Walter Löffler, Neubulach, Fed. Rep. of Germany, assignor to Hollingsworth GmbH, Neubulach, Fed. Rep. of Germany

Filed Oct. 17, 1979, Ser. No. 85,811
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1978, 2846109
Int. Cl.³ D01G 15/32
U.S. Cl. 19—98 9 Claims

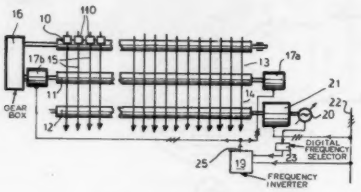


1. A dirt separator for cards having a cylinder with clothing and fixedly mounted carding segments cooperating therewith, comprising: a knife blade having a blade edge arranged against the direction of rotation of the cylinder at a narrow interval from its clothing adjoining a carding segment, said knife blade having adjustment means for adjusting the interval between the knife blade and the clothing of the cylinder, a collecting rail having a substantially flat base surface running parallel to the surface of the cylinder; said knife blade being preceded in the direction of rotation by said flat base surface of said collecting rail, said collecting rail having radial adjustability, said dirt separator being arranged at the outlet end of a carding flat.

## 4,314,388
## ROLLER DRIVE FOR DRAW FRAME

Max Hartmannsgruber, Kirchheim, and Horst Wolf, Albershausen, both of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Mar. 24, 1980, Ser. No. 132,809
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1979, 2911379
Int. Cl.³ D01H 1/22
U.S. Cl. 19—293 9 Claims




1. A fiber-drawing assembly comprising:

a plurality of cascaded drawing stages each including an elongate driven roller and a set of coacting counterrollers;

drive means for simultaneously rotating said driven rollers at different but mutually correlated speeds, said drive means including at least one pair of synchronous motors positively coupled with opposite ends of the driven roller of one of said drawing stages at axially spaced-apart locations; and

a common supply of three-phase current connected to said pair of synchronous motors in a joint energizing circuit for operating same in step with each other, thereby preventing the development of torsional stresses between said locations, said supply including a power line, a solid-state frequency inverter with three phase leads inserted between said power line and said pair of synchronous motors, and a frequency divider of digitally variable step-down ratio inserted between a source of timing signals and said frequency inverter for varying the rhythm of energization of said phase leads.

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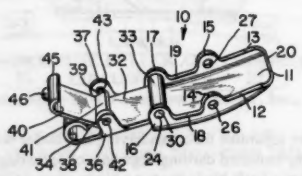
## 4,314,389
## DOUBLE FOLD OVER JEWELRY CLASP

Alfred E. Sauer, Warwick, and Bruno Tassoni, Johnston, both of R.I., assignors to B. A. Ballou & Co., Incorporated, East Providence, R.I.

Filed Oct. 4, 1979, Ser. No. 81,688
Int. Cl.³ A44B 13/00, 21/00
U.S. Cl. 24—376 3 Claims




1. A double fold over jewelry clasp comprising a cover body having means to provide a pintle bearing and oppositely located lock openings, a pintle fastened in said pintle bearing, a clamp plate having a clamp plate bearing on one end and a link eye in the opposite end, means providing hinge pin openings in said clamp plate, said clamp plate bearing being mounted upon said pintle, a lock plate provided with a hinge pin, having catch means, on one end, and a latch hook and finger nail grip on the other end, said hinge pin mounted in said hinge pin openings, wherein pivoting fold over movement of said clamp plate, forces said hook into engagement with said clamp plate bearing, and pivoting fold over movement of said cover body in a direction opposite to the pivoting fold over movement of said clamp plate, forces said lock openings into engagement with said catch means, and means provided between said lock plate and said clamp plate for the attachment of a chain link, said cover overlying said lock plate to prevent displacement of said latch hook with said clamp plate bearing.

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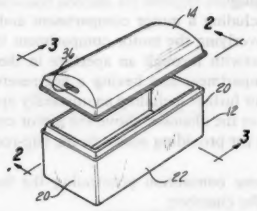
## 4,314,390
## COMPOSITE BURIAL VAULT AND METHOD FOR MAKING SAME

James W. Darby, 2117 Smith St., Danville, Ill. 61832, and David L. Darby, R.R. #1 Box 458-20, Alvin, Ill. 61811

Continuation-in-part of Ser. No. 770,524, Feb. 22, 1977, Pat. No. 4,261,083, which is a division of Ser. No. 522,133, Nov. 8, 1974, Pat. No. 4,060,581. This application Aug. 11, 1980, Ser. No. 177,218
Int. Cl.³ A61G 17/00
U.S. Cl. 27—35 32 Claims




1. A method of forming a composite burial vault comprising the steps:

constructing a liner of plastic material;

after said liner has been formed, applying an adhesive containing a solvent to at least one surface of said liner to thereby temporarily soften the surface;

while said liner is soft and before the adhesive has hardened again, applying a granular material to said surface of said liner, said granular material being applied to substantially all of said surface, whereby when said adhesive has dried, at least a portion of said granular material will be partially embedded into said surface of said liner, whereby said portion of said granular material is both mechanically and adhesively bonded to said surface, the remaining portion of said granular material being adhesively bonded to said liner; and

after said liner has dried with said granular material embedded therein, pouring a flowable concrete material into contact with said surface and said granular material and permitting said concrete material to dry whereby said granular material will act as a mechanical bond between said liner and the hardened concrete material.

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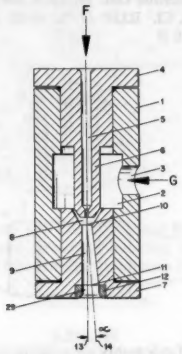
## 4,314,391
## YARN BULKING JET

Peter Heinen, and Peter Gossens, both of Heinsberg-Oberbruch, Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Dec. 26, 1979, Ser. No. 106,771
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1978, 2856290
Int. Cl.³ D02G 1/16
U.S. Cl. 28—273 4 Claims

1. A bulking device for the production of loop yarn, comprising a jet base having an inlet section and outlet section and a blowing chamber intermediate said inlet section and outlet

secion, and means for connecting a blowing medium to said blowing chamber; a pin insert in said inlet section having a conically pointed tip extending through said blowing chamber, said pin insert having a yarn feed channel extending therethrough axially to the jet base; a jet insert in said outlet section having a conical taper aligned with said pointed tip of the pin




insert, followed in order by a diffusor section forming a channel to said blowing chamber the axis of the diffusor section being angularly positioned to the jet axis, the diffusor section having a cylindrical channel segment at the outlet side thereof, the axis of the segment being parallel to but offset from said jet axis.

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**4,314,392**

## METHOD OF MAKING A SPARK PLUG ELECTRODE

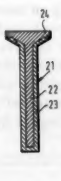
**John S. Waite, Welshpool, Wales, assignor to GKN Floform Limited, Great Britain**

**Filed Dec. 5, 1979, Ser. No. 100,411**

**Claims priority, application United Kingdom, Dec. 16, 1978, 48817/78**

**Int. Cl.³ H01T *13/20***

**U.S. Cl. 29—25.12** **3 Claims**




1. A method of making a centre electrode for a spark plug comprising the steps of superposing slugs of first and second metals with faces of the slugs in direct contact at an interface, said first metal having a thermal conductivity higher than that of said second metal and a melting point lower than that of said second metal, said second metal being resistive to the corrosive environment in which the electrode works; heating the superposed slugs in a radiant furnace wherein the superposed slugs are positioned in a pocket in a black body, the slug of said second metal being positioned wholly within the pocket and the slug of said first metal projecting from the pocket, a portion of the slug of said first metal adjacent said interface being heated mainly by conduction of heat from the slug of said second metal across said interface until said portion melts; cooling the slugs so that they are united at said interface and extruding the united slugs to produce an elongated electrode comprising a core of said first metal within a sheath of said second metal.

**4,314,393**

## METHOD OF MANUFACTURING ACOUSTIC SURFACE WAVE DEVICE

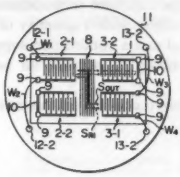
**Noboru Wakatsuki, and Ono Masaaki, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Mar. 26, 1980, Ser. No. 133,964**

**Claims priority, application Japan, Apr. 2, 1979, 54/41963[U]**

**Int. Cl.³ H01L *41/22***

**U.S. Cl. 29—25.35** **17 Claims**




1. A method of manufacturing an acoustic surface wave device, in which acoustic surface waves launched by an input transducer into a piezoelectric material are transmitted to an output transducer through a multistrip coupler, comprising the steps of:

forming on said piezoelectric material first and second input transducers, first and second output transducers diagonally with respect to said first and second input transducers, respectively, said multistrip coupler between said input transducers and said output transducers, and lead patterns between electrodes of each of said second input and second output transducers;

mounting said piezoelectric material on a package base which has first and second pairs of pins therethrough;

bonding the electrodes of said first input and first output transducers to said first and second pairs of pins, respectively, by wires;

testing said device by supplying test signals to said first input transducer and obtaining output signals from said first output transducer through said first and second pairs of pins, respectively; and,

when said testing step indicates said device is usable, fixing a cover to said package base.

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**4,314,394**

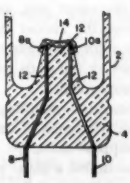
## PHOTOFLASH LAMP CONSTRUCTION AND METHOD OF MAKING SAME

**Donald E. Armstrong, Williamsport; Ronald E. Sindlinger, Muncy, and William J. Harvey, Trout Run, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.**

**Division of Ser. No. 971,775, Dec. 21, 1978. This application Jun. 25, 1980, Ser. No. 162,859**

**Int. Cl.³ F21K *5/02*; H01J *9/24***

**U.S. Cl. 29—25.16** **9 Claims**




1. A method of making a photoflash lamp comprising:

heating one end of a length of glass tubing to seal it closed;

pushing a pair of spaced apart metal lead-in wires through said closed end of the glass tubing while said end of tubing

is in a heated condition, whereby the heated glass thereat is stretched and sealed over said pushed-through lead-in wires to provide a protruding portion of said glass within said tubing which encapsulates the terminations of said lead-in wires within said tubing;

selectively removing only the glass covering the terminations of said lead-in wires within said tubing to expose the bare metal of said terminations;

applying a coating of primer material about the end of said protruding portion of glass within said tubing so as to cover and bridge said bare terminations;

filling said glass tubing with a quantity of filamentary combustible material and a combustion-supporting gas;

tipping off the tubing to provide an hermetically sealed envelope; and

applying a protective coating on the exterior of said envelope.

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**4,314,395**

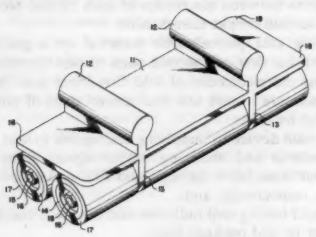
**SURFACE ROLLER**

**William L. Brock, 6480 W. 60th Ave., Arvada, Colo. 80003**

**Filed Oct. 31, 1979, Ser. No. 89,814**

**Int. Cl.³ B21B *27/00***

**U.S. Cl. 29—110.5** **9 Claims**



1. A device for applying pressure to a surface, the device comprising:

a substantially planar elongated base member having an upper face and a lower face;

a pair of carrier supports each positioned inwardly from an end of the base member at the elongated portion thereof, the carrier supports extending perpendicular from the lower face of the base member;

at least two roller assemblies rotatably carried on the carrier supports, each assembly being journaled around an axis extending in the elongated direction of the base member and parallel to the other axis, and each roller assembly extending between the carrier supports and beyond the carrier supports with the ends of each roller assembly extending at least to the ends of the base member in a cantilevered manner; and

a pair of handle members extending from the upper face of the base member, with each of the handle members being aligned with a support carrier;

whereby the rollers define a plane providing a firm support for the device and extend at least to the edge of the base member to facilitate application of pressure in close quarters and corners, while the handle members transmit force directly to the carrier support and roller assemblies to permit the development of great pressures at the roller assemblies.

**4,314,396**

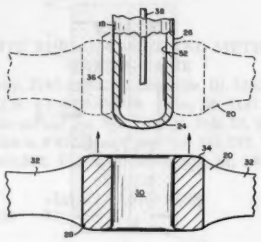
**SEPARABLE BLADE AGITATOR ASSEMBLY AND DISASSEMBLY METHOD**

**Erwin J. Nunlist, Penfield; Howard G. Coleman, Naples, and Edward S. Harrison, Perinton, all of N.Y., assignors to Sybron Corporation, Rochester, N.Y.**

**Division of Ser. No. 17,828, Mar. 5, 1979, Pat. No. 4,221,488. This application Oct. 19, 1979, Ser. No. 88,972**

**Int. Cl.³ B23P *11/02, 6/00, 15/00***

**U.S. Cl. 29—156.8 R** **3 Claims**



2. A method of releasably assembling an impeller having a glass lined bore to a closed end of a hollow glass coated drive shaft in order to provide a gasketless, glass surface-to-glass surface releasable connection therebetween comprising the steps of:

a. providing a hollow glass coated drive shaft having a closed end;

b. sizing the outside diameter of said glass coated shaft end and the inside diameter of said glass lined bore to provide an interference fit therebetween of about 0.00025 to 0.00075 inches per inch of diameter, the amount of the interference being selected within a range which is

i. sufficiently great enough to transmit a desired torque from said drive shaft to said impeller when said shaft and impeller are equalized in temperature and

ii. sufficiently small enough to free said shaft from said bore when said shaft and impeller are at a predetermined differential temperature;

c. cooling said shaft end internally of said shaft to produce said differential temperature and shrink the outside diameter of said shaft end by an amount sufficient to permit said shaft end to pass through said bore;

d. moving said impeller relative to said shaft end until said shaft end is located within said bore; and

e. equalizing the temperature said shaft end and impeller so that the outside diameter of said glass coated shaft end expands into an interference fit engagement with said glass lined bore.

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**4,314,397**

**METHOD OF MAKING A SOLAR HEAT EXCHANGER**

**Patrick F. Goolsby, and George F. Swenck, both of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.**

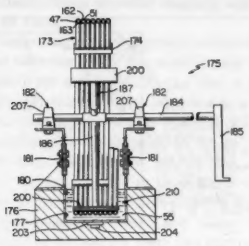
**Division of Ser. No. 907,711, May 19, 1978, abandoned. This application May 9, 1980, Ser. No. 148,406**

**Int. Cl.³ B23P *15/26;* B23K *31/02***

**U.S. Cl. 29—157.3 R** **6 Claims**

1. A method of making a tubular solar liquid-to-liquid heat exchanger comprising the steps of providing an aluminous, heat conductive tube material, forming said aluminous tube material into a substantially helical coil, providing a nonaluminous, heat conductive tube material, forming said nonaluminous tube material into a substantially helical coil, combining said substantially helical coils into a composite coil, preheating said composite coil to a temperature ranging between 725° F. and 800° F., submerging a circumferential portion of said composite coil in a bath of molten solder, rotating said composite coil about its central axis to submerge the entire composite

coil in said molten solder, and ultrasonically vibrating said composite coil and said molten solder during said rotation of said composite coil therein to provide cavitation and thus



ultrasonic cleaning of said composite coil and thereby assure optimum wetting and tenacious bonding by said solder of immediate adjacent faces of said aluminous and said nonaluminous coils.

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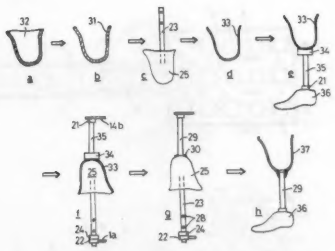
**4,314,398**

**METHOD OF MAKING A LOWER LEG PROSTHESES**

**Torsten L. E. Pettersson, Upsala, Sweden, assignor to Een-Holmgren Ortopediska AB, Sweden**

**Filed Jul. 26, 1979, Ser. No. 61,037**
**Claims priority, application Sweden, Jul. 27, 1978, 7808174**
**Int. Cl.³ B23P *19/00*; B23Q *3/00***
**U.S. Cl. 29—407** **5 Claims**



1. A method of making a lower leg prosthesis, comprising a prosthesis socket, a prosthesis foot and a connecting member interconnecting said prosthesis socket and said prosthesis foot, said method comprising the steps of:

(a) forming a temporary prosthesis socket having an inner shape substantially corresponding to the remaining lower leg stump of the amputee to which the prosthesis is to be attached,

(b) forming a test prosthesis by fixing an adjustable position testing device to said temporary socket and connecting said testing device to said prosthesis foot through a temporary connecting member,

(c) testing said test prosthesis on the patient and adjusting said testing device so as to obtain a proper individually adjusted alignment of said temporary socket in relation to said prothesis foot,

(d) providing a prosthesis socket positive in the temporary socket of said test prosthesis and reproducibly fixing the assembly comprised of the socket positive, the temporary socket, the testing device and at least the temporary connecting member in a support device,

(e) removing the test prosthesis parts from said support device,

(f) placing said connecting member adjacent said socket positive in the support device in the aligned relative position reproducibly set in the support device in step (d), and

(g) forming said prosthesis socket on said socket positive while simultaneously securing said connecting member to the prosthesis socket in said aligned relationship thereby obtaining an individually aligned lower leg prosthesis.

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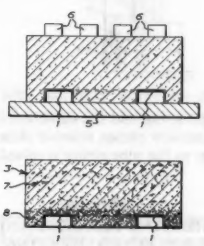
**4,314,399**

**METHOD OF PRODUCING MOULDS**

**Lars M. Severinsson, Östra Hyllievägen 99, 216 22 Malmö , Sweden**

**Filed Jan. 24, 1977, Ser. No. 761,729**
**Claims priority, application Sweden, Jan. 28, 1976, 7600895**
**Int. Cl.³ B22F *3/24***
**U.S. Cl. 29—420** **1 Claim**



1. A method of producing a mold comprising a body of a material having a relatively high strength and heat resistance and a material-shaping surface, which consists of:

(1) depositing a body of sinterable material of metal powder onto the surface of a pattern, the pattern being of a material capable of resisting a predetermined temperature and having a pattern surface which forms a negative picture of said material-shaping surface;

(2) forming said material-shaping surface on said body of said sinterable material as a positive picture of said pattern surface, said sinterable material being sinterable at a sintering temperature which is lower than said predetermined temperature and which is capable before it is sintered to be brought into a relatively easily shapable form and which after it is sintered forms a porous sintered body;

(3) sintering said formed body when still in contact with said pattern surface;

(4) introducing an infiltrating material of a metal into the side of the porous body opposite to said pattern surface, said infiltrating material which has a melting point lower than said sintering temperature melting and flowing into the pores of said porous body whereby said infiltrating material penetrates into the pores of said surface of the porous body formed in contact with said pattern surface, reaches said pattern surface and is shaped by the pattern surface and wherein said infiltrating material contains a slag and the slag is filtered by the body of the sinterable material and clean infiltrant free of slag reaches the pattern surface;

(5) cooling said sintered body which contains the infiltrated material and

(6) separating said body from the pattern surface.

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**4,314,400**

**STRAP CUTTER AND METHOD**

**C. Arthur Davis, Rte. 6, Box 137, Ada, Okla. 74820**

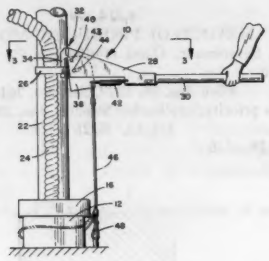
**Filed Aug. 25, 1980, Ser. No. 181,149**
**Int. Cl.³ B23P *19/00*; B26B *13/00***
**U.S. Cl. 29—426.4** **11 Claims**

10. The method of cutting straps which strap electric power cable to the side of a pipe string in a well as the pipe string is being pulled from the well comprising the steps of:

attaching a movable shear blade to the wellhead;

engaging a shear blade behind the strap securing the electric

power cable to the pipe string with the two shear blades in shearing relationship with respect to each other and on opposite sides of the strap to be cut;



pulling the pipe string and the cable out of the well so that pipe string motion causes relative shear blade motion to cut the strap as the pipe string is raised.

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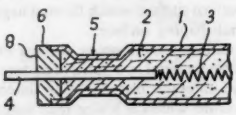
**4,314,401**

## SHEATHED HEATING ELEMENT AND SEALING OF SHEATHED ELECTRIC HEATING ELEMENT

**Isamu Saku, 3-17-6, Minamigaoka, Nisshin-cho, Aichi-gun, Aichi-ken, Japan**

**Filed May 14, 1979, Ser. No. 39,040**
**Claims priority, application Japan, Jan. 29, 1979, 54-8935**
**Int. Cl.³ H05B *3/00***
**U.S. Cl. 29—611** **9 Claims**



1. A method of sealing an electric heating element having an electric heating wire inside a tubular metal sheath and electrically insulated therefrom by a compacted filler, said method comprising:

impregnating the filler at and in the vicinity of the end of the sheath with an electrically insulative solution; and

compressing the sheath in said vicinity such that said electrically insulative solution substantially permeates the interstices within the impregnated filler.

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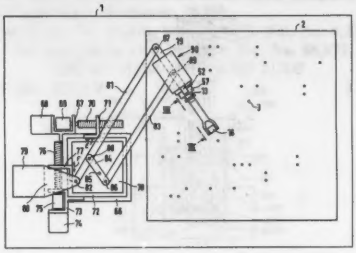
**4,314,402**

## DEVICE FOR ASSEMBLING PRINTED CIRCUIT BOARDS

**Alfred Lemmer, Munich, Fed. Rep. of Germany**

**Filed Aug. 9, 1979, Ser. No. 65,148**
**Claims priority, application Fed. Rep. of Germany, Aug. 11, 1978, 2835341**
**Int. Cl.³ H05K *3/30***
**U.S. Cl. 29—721** **19 Claims**

1. A device for assembling printing circuit boards, said device comprising a support for a printed circuit board to be assembled, an optical illuminating system for illumination of at least one hole on said circuit board, and mounting means mounting at least a portion of said optical illuminating system to move above said support in a plane parallel thereto to direct light from said optical illuminating system to a selected location on the circuit board, said optical illuminating system comprising a housing, a light source, means directing light from said source along an optical axis, and a slide plate movable transverse to said optical axis, said slide plate being formed with at least one hole and one shot, and said slide plate being rotatable about said optical axis, said light source, said means directing light and said slide plate being mounted in said housing, said device further comprising a movable shutter mounted



to extend across said optical axis along one side of said slide plate and movable to cover and uncover said slot, said shutter also being rotatable with said slide plate.

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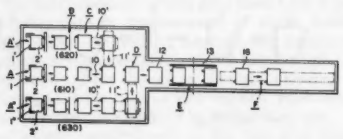
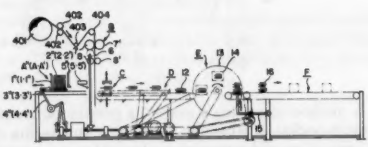
**4,314,403**

## MACHINE FOR AUTOMATICALLY STACKING PLATE GROUPS FOR STORAGE BATTERIES

**Nobuo Sanekata, Takatsuki, Japan, assignor to Yuasa Battery Company Limited, Takatsuki, Japan**

**Continuation-in-part of Ser. No. 882,392, Mar. 1, 1978, abandoned. This application Nov. 26, 1979, Ser. No. 97,482**
**Int. Cl.³ B23P *19/04***
**U.S. Cl. 29—730** **6 Claims**





1. A machine for stacking plate groups for storage battery comprising

(a) means for feeding separator material in a vertical direction from above by a pair of transferring rollers,

(b) means disposed below the feeding means for cutting said separator material into separators from a continuous roll with a roll cutter having at least one cutting edge,

(c) plate separating and delivering means disposed below the cutting means for separating and delivering one-by-one plates in a lowermost step from a hopper containing the plates with a separating plate so as to intersect at right angles with the separator transferred vertically from the transferring rollers, whereby the separator is two-folded about a plate and is cut off to predetermined dimensions with the delivered plate, said plate separating means being positioned so as deliver a plate covered with a separator to a first conveyor line

(d) separator sealing means disposed behind the plate separating and delivering means for sealing the separator covering the plate on the sides,

(e) a transferring element supported adjacent the separator

sealing means for transferring the plate covered with the separator, from said first conveyor line to a second conveyor line, said transferring element comprising chain conveyors and laterally moving elements, said laterally movable elements being movable laterally with respect to said conveyor lines,

(f) plate unit composing means disposed behind the transferring element wherein a line for transferring a plate of a different pole from a third conveyor line is provided in parallel with said laterally moving elements so that the covered plate may be transferred to said second conveyor line to be overlapped with the plate of the different pole to form a plate unit, said line for transferring a plate of a different pole being movable in an opposite direction to the direction of movement of said transferring element

(g) plate block composing means and along said second conveyor disposed behind the plate unit composing means for laminating a predetermined number of plate units to be a block, and

(h) conveying means disposed behind the plate block composing means for conveying said block to the next step.

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**4,314,404**

## RAZOR WITH PRE-WETTING OR CAPILLARIZER SYSTEM

**Rene A. Ruiz, and George Spector, both of 3615 Woolworth Bldg. 233 Broadway, New York, N.Y. 10007**

**Filed Feb. 20, 1980, Ser. No. 123,001**
**Int. Cl.³ B26B *21/00***
**U.S. Cl. 30—41** **3 Claims**

1. A safety razor, comprising in combination, a handle, a head on one end of said handle comprising a pressure plate and a clamp plate with a blade therebetween, a foam rubber pad between said blade and said clamp plate, and a replaceable cartridge in said handle dispensing a pre-wetting agent to said pad, including means for conducting said agent to said pad through said handle and head in further combination with a second pad secured to said pressure plate abutting said blade, underside including a second means for conducting said agent to said second pad.

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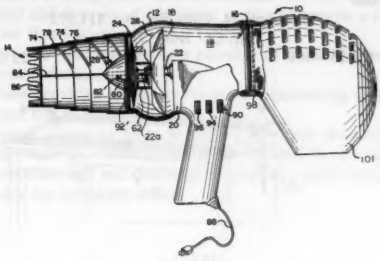
**4,314,405**

## HAIR CUTTING DEVICE

**Du P. Park, 3656 W. Montrose, Chicago, Ill. 60618**

**Filed Apr. 24, 1980, Ser. No. 143,315**
**Int. Cl.³ B26B *19/00*; A45D *20/00***
**U.S. Cl. 30—133** **17 Claims**

1. A suction type hair cutting device comprising a housing defining a passage having an inlet and an outlet, blade means between said inlet and said outlet with drive means imparting a cutting action to said blade means and an impellor driven by said drive means producing a suction at said inlet, and a conical



element rotatable with said blade means for directing hair to the periphery of said passage for said cutting action.

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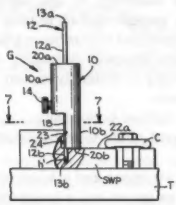
**4,314,406**

## COMBINATION TRANSFER DEPTH GAUGE

**Gary D. Barnes, 611 Hermitage St., San Jose, Calif. 95134**

**Filed Feb. 6, 1980, Ser. No. 119,089**
**Int. Cl.³ G01B *5/18***
**U.S. Cl. 33—169 B** **3 Claims**

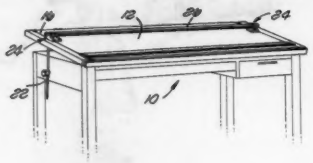


1. A transfer gauge for measuring the depth of a bore or the like formed in a workpiece, said gauge being of the type having a single body, a planar measurement reference face at one end of said body, a single depth gauging rod, an elongate guide recess for said rod formed in said body for slidably receiving said gauging rod and means for clamping said gauging rod to said body; the improvement wherein said gauge is capable of directly gauging the depth of a round walled bore from a workpiece face, wherein the workpiece has an upstanding shoulder that projects outwardly from said workpiece face and wherein the shoulder is tangent to a wall of the bore; said guide recess being a round walled longitudinal through-bore formed in said body, said bore being perpendicular to said planar end reference face of the body, one end portion of said body being relieved to provide a shoulder-clearing face that extends parallel to said bore and that intersects said bore along a minor chord of the round wall of the bore so that the wall of said bore encompasses more than 180°; said gauging rod comprising a single length of rod steel wire having an end slidable past said body reference face, the minor segment of the longitudinal extent of the wire that is disposed along said shoulder-clearing face of the body being confined by the wall of said bore but being exposed and projecting past said face, the relationship between said exposed minor segment of the wire and the relieved face of the body being such that a plane tangent to the exposed segment of the wire and tangent to said body at one side of the wire clears the body at the other side of the wire, said clamping means comprising a set-screw threaded into the other, unrelieved end portion of said body.

## 4,314,407
## DRAFTING BOARD STORAGE TRAY

James B. Kawahara, 1721 S. Third St., Apt. B, Alhambra, Calif. 91803

Filed Jan. 14, 1980, Ser. No. 111,572
Int. Cl.³ B43L 7/00
U.S. Cl. 33—444 12 Claims



1. A drafting board tray, for use on a drafting board having a cable mounted slideable straightedge assembly, comprising:
- a first and a second tray mount;
- a tray extending between said first and second tray mounts; and
- each of said first and second tray mounts comprising:
  - a base;
  - an end piece pivotally adjustably attached to said base and held in a desired pivotal position relative to said base; said piece engaging a respective end of said tray; and
  - a cable guide mounted on said base and adapted to feed a first portion of the cable used for slideably mounting the straightedge assembly to the other of said first and second tray mounts and to receive from said other of said first and second tray mounts a second portion of the cable used for slideably mounting the straightedge assembly, thereby to slideably mount the said base to the drafting board,
- said cable guide further comprising:
- a first and a second guide wheel rotatably attached to said base;
- said base having an upper and a lower end and the drafting board having an upper and a lower end;
- a first passage in said upper end of said base and a second passage in said lower end of said base;
- a third passage extending through said base;
- said first portion of the cable entering said base through said first passage from the direction of said upper end of the drafting board, passing over said first guide wheel and through said third passage to said other of said first and second tray mounts; and,
- said second portion of the cable entering said base through said third passage from the direction of said other of said first and second tray mounts passing over said second guide wheel and passing out of said base through said second passage in the direction of said lower end of the drafting board.

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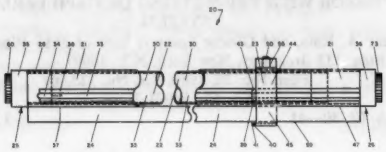
## 4,314,408
## COMBINATION DRAFTING INSTRUMENT INCLUDING ROTATABLE SCALES, COMPASS ASSEMBLY AND STRAIGHT EDGE MAGNIFIER

Dwight E. Shoemaker, 9234 Chatwood Dr., Houston, Tex. 77078

Filed Nov. 26, 1979, Ser. No. 97,128
Int. Cl.³ B43L 7/08
U.S. Cl. 33—494 7 Claims

7. A drafting instrument comprising:
- an outer tubular body, said tubular body having a longitudinal axis, said tubular body having inner and outer surfaces, said tubular body having an axially elongated viewing slot communicating between said inner and outer surfaces, said tubular body having a bore extending longitudinally therethrough, said bore being adapted to receive a graphics tube, said tubular body having a guide groove extending longitudinally along said outer surface;
- a graphics tube, said graphic tube being adapted to fit within said bore, said graphics tube having a face, said graphics tube having scales on the face of said graphics tube, said scales being viewable through said viewing slot when said graphics tube is rotated to bring the corresponding face of said graphics tube into alignment with said viewing slot, said graphics tube having a first end and a second end;
- a straightedge magnifier, said magnifier being connected to said outer surface of said tubular body, said magnifier being adapted to magnify images on a working surface, said magnifier having a straightedge extending substantially parallel with the longitudinal axis of said tubular body, said straightedge being adapted to guide a marking implement in a substantially straight line upon a working surface, said straightedge magnifier having a fixed hairline register means, said register means being aligned with initial graduations upon said scales;
- a cursor assembly, said cursor assembly being adaptable to slideably register upon said outer surface of said tubular body, said cursor assembly having a guide shoe, said guide shoe being adapted to register within said guide groove along said outer surface of said tubular body, said cursor assembly having an upper hairline means and a lower



hairline means, said upper hairline means being alignable with a graduation upon said scales through said viewing slot, said lower hairline means being alignable upon a working surface, said cursor assembly being adapted to slide longitudinally along said outer surface of said tubular body;
- a first raised knob, said first raised knob being adapted to fit within the first end of said graphics tube;
- a second raised knob, said second raised knob being adapted to fit within the second end of said graphics tube; and,
- said tubular body, said graphics tube, said straightedge magnifier, said cursor assembly, said first raised knob and said second raised knob being mutually cooperable to provide a plurality of rotatable scales viewable one at a time through a viewing window, and to provide hairline means which may be aligned simultaneously upon the viewable scale and a working surface while a corresponding image upon the working surface is magnified, said first raised knob and said second raised knob being cooperable to permit rotation of said graphics tube within said tubular body while inhibiting substantial longitudinal movement of said graphics tube with respect to said tubular body when said first raised knob and said second raised knob are inserted into the first and second ends of said graphics tube while said graphics tube is inserted into the bore of said tubular body.

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## 4,314,409
## AUTOMATIC LINT SCREEN CLEANER AND STORAGE SYSTEM FOR DRYER

Roger J. Cartier, and Gordon J. Krolzick, both of Benton Township, Berrien County, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 6, 1980, Ser. No. 119,194
Int. Cl.³ F26B 11/04
U.S. Cl. 34—82 17 Claims

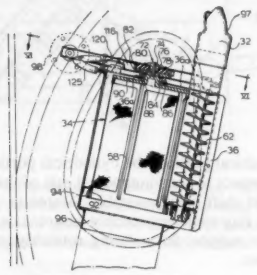
1. In a dryer having a drum for tumbling a clothes load and a blower means for circulating heated air through said clothes

load to an air flow passage, an automatic lint screen cleaner and storage mechanism for separating lint from said circulating air, said mechanism comprising:

a cylindrical rotating lint screen in said air flow passage for collecting lint carried by said air on an outer surface of said lint screen;

a stationary wiper means mounted adjacent to and in frictional contact with said outer surface for separating said collected lint from said screen; and

lint passage means surrounding a portion of said screen for directing said separated lint to a storage container, said lint passage means including a compression means for compressing said lint to require a smaller volume for storage and a transport tube connecting said compression means to said storage container.



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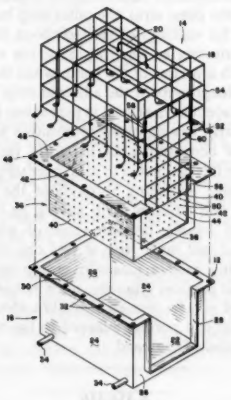
**4,314,410**

**ANIMAL DRYER**

**Margaret W. Nichols, Richardson, Tex., assignor to Richard Smarzak and Winifred Wisner, both of Dallas, Tex., a part interest**

**Filed Jun. 13, 1980, Ser. No. 159,219**
**Int. Cl.³ F26B *25/06***
**U.S. Cl. 34—202** **21 Claims**



1. An apparatus for containing and drying an animal and comprising:

an enclosure for containing the animal, said enclosure having an upper and lower section;

said upper section being of an open cage-like configuration and attached to said lower section;

said lower section having a plurality of opposed side and end walls and having a flooring;

an inner housing disposed within said lower section and in open communication with the upper section, said inner housing having a plurality of opposed side and end panels and a flooring panel spaced from said end and side walls and said flooring of said lower section to provide a chamber therebetween;

said inner housing having a plurality of spaced holes provided therein;

means provided in said enclosure for permitting entrance and exit of the animal; and

exterior means to force heated air into said chamber and through said holes in said inner housing for circulation therethrough and discharge through the upper section to dry the contained animal.

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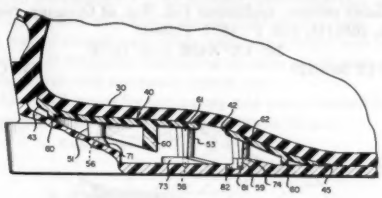
**4,314,411**

**REMOVABLE, ADJUSTABLE, FOOT-SUPPORTING AND FOOT-POSITIONING, ORTHOPEDIC INSERTS FOR USE IN ATHLETIC FOOTWEAR**

**Chris A. Hanson, Boulder, Colo., assignor to Hanson Industries Incorporated, Boulder, Colo.**

**Filed Mar. 13, 1980, Ser. No. 130,200**
**Int. Cl.³ A43B *7/14, 5/04***
**U.S. Cl. 36—81** **13 Claims**



1. In athletic footwear, the improvement comprising providing in combination with said footwear along desired portions at or near the floor thereof, a removable, adjustable, foot-supporting and foot-positioning, contoured, orthopedic insert for selectively, adjustably, and correctly supporting and positioning bottom regions of the foot, including, but not limited to, the heel and connecting arch region thereof, relative to the floor of the footwear, which, in turn, selectively and correctly supports and positions the leg relative to the footwear, said insert having adjusting means operatively associated therewith for selectively adjusting, varying or controlling its position or distance at a plurality of regions thereof and that of the foot relative to the floor of the footwear, said adjusting means including a respective peg depending from the bottom of said insert at each of said respective regions, and removable spacer members selectively inserted onto and removably retained by a respective peg.

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**4,314,412**

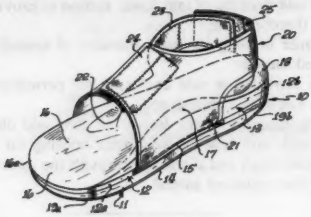
**ORTHOPEDIC SHOE**

**Blair V. Anderson, 1695 Lakeside Dr., Reno, Nev. 89509; Morris Feldman, 528 "B" St., Santa Rosa, Calif. 95401, and Richard Jacoby, 12439 N. 32nd St., Phoenix, Ariz. 85032**

**Filed Mar. 20, 1980, Ser. No. 132,258**
**Int. Cl.³ A43B *3/24, 3/14, 13/08***
**U.S. Cl. 36—100** **6 Claims**

1. An orthopedic shoe comprising in combination: A rigid platform having an upper and lower surface wherein the said lower surface is essentially flat, but with an upwardly curved portion at its front and at its rear, and wherein the upper surface is so configured as to fit the lower surface of a human foot; at least one removable closure closing at least one opening adjacent the upper surface of said platform; at least one removably adhering flexible means building up a portion of the upper

surface of said platform; foot encompassing strap means extending through a transverse opening in said platform; and means to fasten said foot encompassing strap about a human foot.



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**4,314,413**

**SPORTS SHOE**

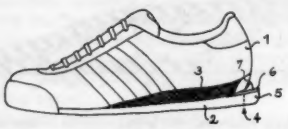
**Adolf Dassler, Kreuzgasse, D-8522 Herzogenaurach, Fed. Rep. of Germany**

**Continuation of Ser. No. 829,470, Aug. 31, 1977, abandoned. This application Oct. 19, 1979, Ser. No. 86,446**

**Claims priority, application Fed. Rep. of Germany, Nov. 29, 1976, 2654116; Feb. 17, 1977, 2706645**

**Int. Cl.³ A43B 5/00, 13/00**

**U.S. Cl. 36—129** **13 Claims**



**1.** In a sports shoe for long distance running on hard tracks, comprising a flexible outsole of resilient plastics material and having a substantially flat profiled tread side, contactable with said track and a shoe upper having a heel end and a lower rim, the improvement comprising an extension of said flexible outsole projecting rearwardly substantially in the plane of the tread beyond said lower rim of the shoe upper at the heel end of the outsole, said extension being resiliently cantilevered and bendable at the heel end along an axis substantially perpendicular to the length of the shoe thereby to flex at said axis in substantially cantilever fashion to form a curved portion of said tread side during use of the shoe when pressure is applied to the bottom of the extension.

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**4,314,414**

**TRENCH DIGGING APPARATUS AND BEARING THEREFOR**

**John M. Reynolds, Wirral; Colin E. Gibson, Upton; John S. Seamans, Wirral, all of England, and Anton R. F. van der Steen, Near Ruthin, Wales, assignors to Land and Marine Engineering Limited, Liverpool, England**

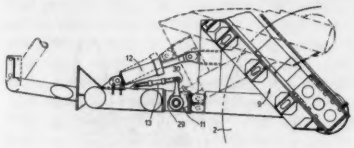
**Filed Sep. 17, 1979, Ser. No. 76,476**

**Claims priority, application United Kingdom, Nov. 29, 1978, 46574/78**

**Int. Cl.³ E02F 5/02**

**U.S. Cl. 37—54** **11 Claims**

**1.** A trench digging apparatus comprising a basic framework, a cutter wheel rotatably mounted on a support frame, drive means for rotating the cutter wheel about a substantially horizontal axis, cutting means projecting from the outer periphery of the cutter wheel, said support frame being pivotally mounted and supported on the basic framework by hinge bearing means, said support frame being pivotally controlled by cylinder means connected to said support frame and said basic framework, said hinge bearing means allowing pivotal movement about an axis extending generally horizontally and transversely of the framework, and a limited amount of movement about a generally vertical axis, each hinge bearing means comprising a shaft having an enlarged diameter centrally located cylindrical portion, the cylindrical portion being eccentric with respect to the longitudinal axis of the shaft, end portions of said shaft being rotatably located in the basic framework and a ring member rotatably mounted on said cylindrical portion, the support frame being rotatably mounted on said ring member.



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**4,314,415**

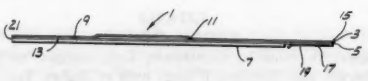
**IDENTIFICATION BANDS AND METHODS OF AND APPARATUS FOR MAKING THEM**

**Kenneth J. De Woskin, University City, Mo., assignor to Beltx Corporation, Barnhart, Mo.**

**Filed Oct. 9, 1979, Ser. No. 82,953**

**Int. Cl.³ G09F 3/14**

**U.S. Cl. 40—21 C** **20 Claims**



**1.** An identification band comprising a plurality of strips laminated together by pressure-sensitive adhesive, one of the strips constituting an outer strip, an insert underlying the outer strip having pre-printed identification indicia on one face thereof facing the outer strip, the outer strip being transparent at least in part for visibility of the indicia on the insert, one of the strips constituting an inner strip having an exposed face engageable with a wearer of the band, when the band is worn, and extending lengthwise of the adjacent strip but terminating short of the adjacent strip at least in part at one end of the band, said adjacent strip having pressure-sensitive adhesive on one surface thereof constituting an inwardly facing surface by means of which it is laminated to said inner strip, said pressure-sensitive adhesive extending throughout the length of said adjacent strip, said adjacent strip having an inwardly facing surface portion having pressure-sensitive adhesive thereon exposed beyond said inner strip at said one end of the band, said band having release means over the pressure-sensitive adhesive on said portion, whereby, upon removing the release means, the band may be formed into a bracelet with said adjacent strip at said end portion adhered to the outer strip adjacent the other end of the band.

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**4,314,416**

**DIAPOSITIVE FRAMES**

**Johannes Lorsch, An der Bleiche 49, D-4172 Straelen, Fed. Rep. of Germany**

**Filed Jul. 7, 1980, Ser. No. 166,707**

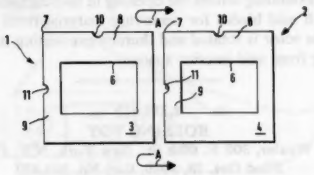
**Claims priority, application Fed. Rep. of Germany, Jul. 5, 1979, 2927109**

**Int. Cl.³ G09F 1/12**

**U.S. Cl. 40—152** **9 Claims**

**1.** A diapositive frame comprising two substantially identical frame halves, each of said frame halves including a rectangular

picture area, each of said frame halves further including two adjacent edge portions having first and second surface indentations in said edge portions, said frame halves capable of fitting together in substantially overlapping position for locating said first surface indentation of one frame half in alignment with



said first surface indentation of the other frame half, whereby rotation of one frame half with respect to the other frame half by 180° around an axis transverse to the frame causes substantial alignment of said second surface indentations with each other.

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**4,314,417**

## MOTOR VEHICLE REGISTRATION PLATE HOLDER

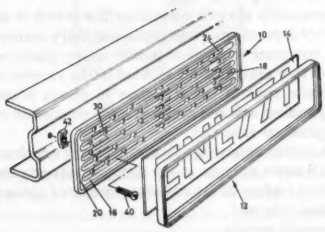
**James T. Cain, Krugersdorp, South Africa, assignor to JNPC Investments (Proprietary) Limited, Randburg, South Africa**

**Filed Jul. 19, 1979, Ser. No. 58,807**

**Claims priority, application South Africa, Jul. 25, 1978, 78/4230**

**Int. Cl.³ G09F *7/00*; B60R *13/10***

**U.S. Cl. 40—209** **4 Claims**



**1.** A motor vehicle registration plate holder including a rectangular backing member which is adapted for attachment to a motor vehicle, and a removable frame member which is made from a plastics material and which is dimensioned to cover the periphery of a registration plate located on the backing member, the frame member including at least one formation which in use of the holder bears on the front face of the plate and at least one locking formation which is by resilient deformation of the frame member engageable with the backing member to lock the registration plate between the frame and backing member, the backing member being made from a resilient plastics material and including integrally molded resilient formations which in use of the holder bias the registration plate into contact with the frame member.

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**4,314,418**

## MESSAGE CONTROL UNIT

**Robert L. Narens, 8704A Gregory La., Des Plaines, Ill. 60016, and Frank D. Billeck, 456 Chicory La., Buffalo Grove, Ill. 60090**

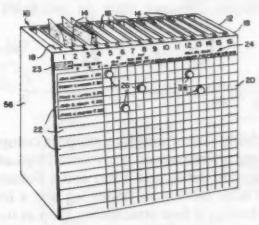
**Filed Feb. 7, 1980, Ser. No. 119,556**

**Int. Cl.³ G09F *3/00***

**U.S. Cl. 40—358** **11 Claims**

**1.** A message control unit for use in an office reception area or like environment whereby information concerning messages and personnel availability is provided in a coordinated form which is quickly and easily assimilated upon rapid visual inspection, said message control unit comprising:

(a) receptacle means for receiving and storing messages, the top edges of said receptacle means all being situated in one plane and the bottom walls of said receptacle means all being situated in a second plane parallel to said first plane;



(b) first wall means formed integrally with said receptacle means for supporting an attached plate, said attached plate including chart means for organizing and presenting selected information in an orthogonal pattern, said first wall means further including a digital time and date unit;

(c) a pair of second wall means integrally formed with said receptacle means for connecting the sides of said first wall means with said receptacle means; and

(d) third wall means for connecting said pair of second wall means together and with said receptacle means.

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**4,314,419**

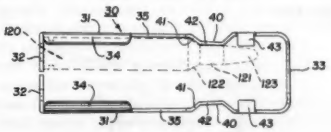
## RIFLE MAGAZINE DEVICE

**Homer E. Koon, Jr., Carrollton, Tex., assignor to Alpha Arms, Inc., Dallas, Tex.**

**Filed Dec. 7, 1979, Ser. No. 101,276**

**Int. Cl.³ F41C *25/02***

**U.S. Cl. 42—50** **7 Claims**



**1.** A rifle magazine adapted to be mounted in a rifle having a receiver, said magazine being at a position in said rifle opening into said receiver of said rifle and comprising: opposite spaced substantially parallel side walls; a rear end wall secured along opposite side edges with rear end edges of said side walls; a forward end wall parallel with said rear end wall and perpendicular with said side walls secured along opposite side edges with forward end edges of said side walls; a cartridge shell case retainer flange along the top edge of the rear portion of each of said side walls; an internal cartridge case retainer boss across each side wall forward of and perpendicular to said retainer flanges; and an upwardly and forwardly sloping top guide edge surface on each of said side walls along each of said retainer bosses for guiding cartridge cases upwardly and inwardly as said cartridge cases are moved toward said forward wall from said retainer flanges.

## 4,314,420
## FISHING DEVICE

Robert J. Dickinson, 501 S. Wisconsin, and James L. Wagner, 515 E. Fourth, both of Mitchell, S. Dak. 57301

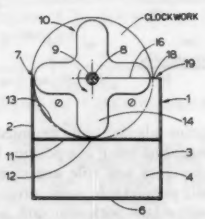
Filed Mar. 21, 1980, Ser. No. 131,932
Int. Cl.[3] A01K *85/00*
U.S. Cl. 43—42.39 6 Claims

1. A self-righting sinker and lure support comprising:
a sinker having a streamlined body with front and rear ends, first and second sides, and a top and a bottom;
an L-shaped wire having an upper leg and a lower leg, the upper leg having a first attachment loop at its upper outer end for attachment of a fishing hook assembly and forming at its lower end with the upper end of the lower leg a second attachment loop for attaching a fishing line, the lower leg having its lower outer end embedded in the sinker and extending out of the front end of the sinker, wherein the second attachment loop is positioned above and forward of the front end of the sinker, and wherein the first attachment loop is positioned above and rearward of the second attachment loop; and
a V-shaped wire bent substantially at its mid-point to form first and second trailing legs having their forward ends embedded in the sinker and extending out of the rear end of the sinker, the first and second trailing legs diverging from one another, the lower outer end of the lower leg of said L-shaped wire having a hook which extends over said V-shaped wire substantially at its mid-point to aid in retaining said V-shaped wire in said sinker despite any pulling force that may be exerted on the trailing legs of the V-shaped wire.

## 4,314,421
## ROTARY INSECT TRAP

Chan W. Cheong, 509 Sin Chew Jit Poh, Keppel Rd., Singapore 2, Singapore

Filed May 13, 1980, Ser. No. 149,396
Claims priority, application Norway, Jun. 5, 1979, 791856
Int. Cl.[3] A01M *1/00*
U.S. Cl. 43—111 5 Claims

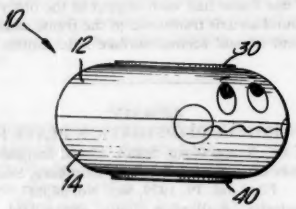



1. An insect trap comprising a housing defining an interior space and an opening which has two opposite parallel sides which are substantially straight and which provides access to the interior space, a rotor mounted in said opening as a closure and having a rotor shaft which is disposed substantially half way between said opposite sides and substantially parallel thereto and also having a plurality of closely-spaced blades fitted on said shaft to rotate therewith, each of said blades having a central region and a plurality of wings radiating from said central region, a plate member attached to the housing at one of said sides of the opening and extending into said interior space, said plate member being curved about the rotor shaft so that at least one wing of each blade is substantially in contact with the plate member, drive means connected to rotate the rotor, and a comb member mounted on the housing at the other of said two opposite sides of the opening and having a plurality of teeth extending within the opening in interdigitated relationship with said blades for removing material from the blades when the rotor is rotated and thereby preventing insects from escaping from said interior space.

## 4,314,422
## ROLLING TOY

Howard Wexler, 300 E. 40th St., New York, N.Y. 10016

Filed Oct. 28, 1980, Ser. No. 201,433
Int. Cl.[3] A63H *15/08*
U.S. Cl. 46—134 13 Claims




1. A random motion tumbling toy, comprising:
(a) a hollow container
(1) radially symmetrical about a longitudinal axis, the container having
(2) a generally smooth curved surface which is sufficiently free of depressions, projections and sharp corners to allow the container to pitch or tumble in any plane; with
(3) two thin annular discs secured to the exterior surface of opposite ends of the container in planes normal to the longitudinal axis and symmetrically positioned around the longitudinal axis; and
(4) the container having a largest diameter which is about 1.8 to 1.9 times as large as the distance between the top and bottom surface of the container measured along the longitudinal axis; and
(b) a spherical weight
(1) located within the container, having
(2) a diameter sufficiently smaller than the distance between the top and bottom surface of the container measured along the longitudinal axis so that the spherical weight can freely move about within the container; and having
(3) a mass greater than the mass of the container.

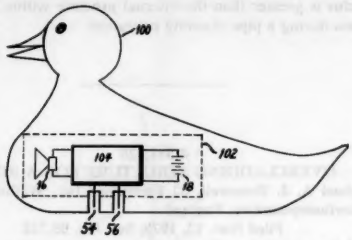
## 4,314,423
## SOUND PRODUCING TOY

Barry R. Lipsitz, 44 Purdy Rd., E., Norwalk, Conn. 06850, and Kevin O. Dolinar, 317H. Hunting Creek Rd., Canonsburg, Pa. 15317

Filed Jul. 9, 1979, Ser. No. 55,822
Int. Cl.[3] A63H *23/10;* A01M *31/06;* A63H *5/00*
U.S. Cl. 46—232 10 Claims

1. A sounding toy comprising:
electronic sounding means including an electronic circuit connected to a transducer;
means for supporting said sounding means, said support means having a bottom surface and including a watertight container for keeping said sounding means dry while floatedly supported on water;
electrical current supplying means located within said container for providing current to said electronic circuit; and
a water-activated switch for activating said electronic cir-

cuit to produce a sound when said bottom surface is placed in water and to stop producing said sound when said bottom surface is removed from water,




said switch including probe means electrically connected to said current supplying means and protruding in watertight relation through said bottom surface.

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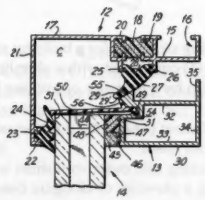
**4,314,424**

## THERMAL WINDOW CONSTRUCTION

**Stanley J. Gordon, and Henry R. Frambach, both of 175 Sea Cliff Ave., Glen Cove, N.Y. 11542**

**Filed Dec. 26, 1979, Ser. No. 106,673**
**Int. Cl.³ E05D *7/00***
**U.S. Cl. 49—400** **20 Claims**



1. A window construction comprising a fixed frame assembly including spaced parallel horizontal and vertical frame components, each said frame component including an inner frame member adapted to be secured to a building opening, an outer frame member exposed to the exterior environment, and a thermal break interposed between said inner and outer members, an operating frame including upper, lower and side profile members disposed in a generally rectangular configuration, one said profile member being pivotally connected to an inner frame component of said fixed frame assembly, said profile members of said operating frame including at the outermost face thereof an outwardly facing glazing surface, a multiple pane sub-assembly secured to said glazing surface of said operating frame, said sub-assembly including a spaced parallel pair of glass lites having spacer means disposed therebetween and bonded to the opposed interior surfaces of said lites adjacent the margins thereof, said sub-assembly being disposed forwardly of all portions of said operating frame, a first seal member mounted on said glazing surface of said operating frame and engaging the inner surface of the innermost of said lites about a continuous contact area inwardly spaced from the marginal edges thereof, said inner surface, first seal member and glazing surface defining together a laterally outwardly open perimetal channel portion accessible in a direction parallel to said panes, said channel being substantially completely filled with a quantity of silicone engaging opposed portions of said lite and said glazing surface, said outer frame member of said fixed frame including a laterally directed perimetal flange portion, flexible seal means interposed between said flange portion and the outer face of said outer glass lite in the closed position of said operating frame to define a substantially continuous seal area adjacent the margins of said lite.

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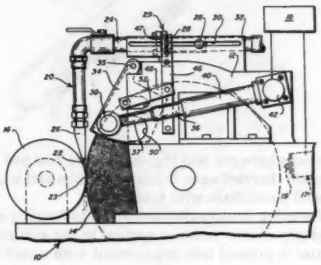
**4,314,425**

## COOLANT ASSEMBLY FOR A CYLINDRICAL GRINDING MACHINE

**Robert E. Bricker, Waynesboro, and Paul J. Humpleby, Chambersburg, both of Pa., assignors to Litton Industrial Products, Inc., Waynesboro, Pa.**

**Filed Jul. 10, 1980, Ser. No. 168,457**
**Int. Cl.³ B24B *55/02***
**U.S. Cl. 51—267** **1 Claim**



1. A cylindrical grinding machine having
a base for supporting a rotatable workpiece,
a wheelhead assembly mounted on said base for horizontal displacement thereon including
a grinding wheel for effecting stock removal from the workpiece,
housing means for rotatably supporting and guarding said grinding wheel,
dresser means including a selectively advanceable dressing tool for dressing the grinding wheel,
coolant assembly means including a horizontal member and a vertically downwardly extending nozzle,
means for mounting said coolant assembly means on said wheelhead assembly for relative horizontal displacement whereby the vertical orientation of said nozzle will be maintained,
means for horizontally slidably displacing said coolant assembly means relative to said housing means as said grinding wheel is reduced in size to continuously maintain said vertically downwardly extending coolant nozzle vertically above the area of said grinding wheel which grindingly engages the workpiece including
wheel hood means pivotally mounted to said housing means for shrouding the grinding wheel,
means for incrementally pivotally displacing said wheel hood means to maintain said wheel hood means proximate said grinding wheel,
first link means pivotally mounted at one end to said housing means and operatively connected to said coolant assembly means at the other end thereof, and
second link means pivotally mounted at one end to said wheel hood means and pivotally mounted at the other end to a medial portion of said first link means.

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**4,314,426**

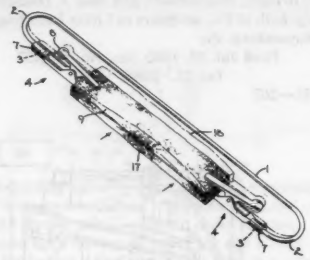
## SMOOTHING AND CLEANING OF MOLDED CERAMICS

**Jack W. Friend, 3509 W. National Ave., Milwaukee, Wis. 53215**

**Filed Dec. 23, 1980, Ser. No. 219,539**
**Int. Cl.³ B24D *15/00***
**U.S. Cl. 51—393** **4 Claims**

1. Apparatus for manually smoothing and cleaning semihardened ceramic articles prior to firing thereof in a kiln, comprising:

(a) an elongated body of spring material,
(b) said body being formed at its ends into reverse bends forming a pair of spaced opposed springable stub legs normally disposed generally parallel to said body,
(c) fastening devices disposed on the terminus portions of said legs,
(d) a flexible elongated abrasive pad attached by said fastening devices between said legs so that the said pad is freely suspended therebetween in taut condition and is disposed in spaced parallelism with said body,
(e) said fastening devices and said stub legs forming means to springingly absorb pressure applied to the said pad when the latter is pressed into engagement with a said ceramic article and a reciprocating smoothing and cleaning movement applied.



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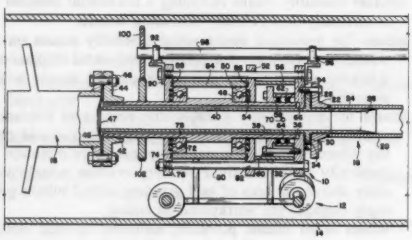
**4,314,427**

## INTERNAL PIPE CLEANING APPARATUS UTILIZING FLUENT ABRASIVE

**Woodrow W. Stoltz, P.O. Box 35103, Tulsa, Okla. 74135**

**Filed Dec. 17, 1979, Ser. No. 104,426**
**Int. Cl.³ B24C *3/32***
**U.S. Cl. 51—411** **6 Claims**



1. An apparatus for cleaning the interior of pipe sections and comprising a rotatable cleaning head, spindle means secured to the cleaning head, said spindle means including a non-rotatable passageway means for directing abrasive materials to the cleaning head for impinging thereof against the inner periphery of the pipe during a cleaning operation, rotatable means supported by the non-rotatable passageway means for transmitting rotation to the cleaning head, seal means interposed between the rotating means and the non-rotating passageway means for precluding leakage therebetween, air pressure sealing means interposed between the passageway means and seal means for precluding contact of the abrasive materials with the seal means, and wherein the rotatable means comprises a sleeve member secured to the cleaning head and concentrically arranged around the outer periphery of the insert means and rotatable with respect thereto, bearing housing means supported by the insert means, sealing means interposed between the sleeve member and bearing housing means for precluding leakage of fluid therebetween, air gap means provided in said bearing housing means and in open communication with the annulus between the sleeve member and insert means, passageway means provided in said bearing housing means in communication with the air gap means for directing fluid pressure thereto whereby the pressure within the air gap means and a-nulus is greater than the internal pressure within the insert means during a pipe cleaning operation.

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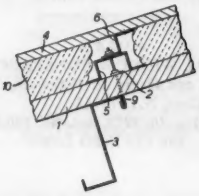
**4,314,428**

## OVERCLADDING STRUCTURE FOR A ROOF

**Michael A. J. Bromwell, 32 Ferrestone Rd., Wellingborough, Northamptonshire, England**

**Filed Nov. 13, 1979, Ser. No. 93,732**
**Claims priority, application United Kingdom, Nov. 17, 1978, 44947/78**
**Int. Cl.³ E04B *7/00***
**U.S. Cl. 52—22** **5 Claims**



1. An overcladding structure for a building roof including an existing roof sheet (1) connected with a plurality of fixed parallel spaced purlins (3) by a plurality of existing fastening means (2), comprising
(a) an outer roof sheet (4) arranged in spaced relation above the existing roof sheet;
(b) means connecting said outer roof sheet with the building roof, including a plurality of elongate bearer members (6) arranged between the outer and existing roof sheets opposite said purlins, respectively, and first connecting means additional to the existing fastening means, said first connecting means connecting said bearer members with said purlins, respectively; and
(c) a mass of thermal insulation material (10) arranged in the space defined between said existing and outer roof sheets, whereby an insulated overcladding roof structure is provided for a building without removing the existing roof sheet.

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**4,314,429**

## SIDING HOLDER

**Ernest Casteel, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007**

**Filed Feb. 20, 1980, Ser. No. 123,000**
**Int. Cl.³ E04F *21/00*; E04D *15/00***
**U.S. Cl. 52—127** **3 Claims**

1. A siding holder comprising in combination an inverted U-shaped hook and a hanger forming an upward notch, said hook adapted to rest on an upper edge of an already-installed lap siding board, said upward notch adapted to support an uninstalled lap siding wherein said hook and hanger are attached to a longitudinal flat leg extending downwardly of said hook and hanger forming a common wall between said hook and hanger which are disposed adjacent each other on oppo-

site sides of said leg, said hanger and hook having spaced transverse surfaces adapted to abut said lapped sidings, in

further combination with means for varying the spacing of said surfaces.

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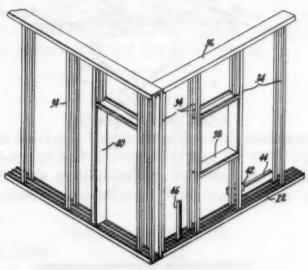
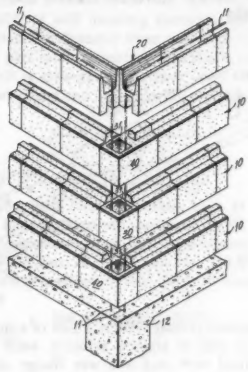
**4,314,430**
**CORE BUILDING SYSTEM**
**Albert J. Farrington, Phelps St. R.D. 1, Gloversville, N.Y. 12078**
**Filed May 14, 1979, Ser. No. 38,933**
**Int. Cl.³ E04B *1/16***
**U.S. Cl. 52—206** **6 Claims**



1. A method for the construction of a load-bearing wall comprising the steps of:
(a) positioning first track means along the lower edge of where said wall is to be placed, said first track means including first and second channel means;
(b) setting a plurality of upright means into said first and second channel means;
(c) positioning second track means about the upper edge of where said wall is to be placed, said second track means also including first and second channel means, said plurality of upright means extending between said first and second channel means of said first and second track means;
(d) positioning form means about said track means;
(e) pouring concrete between said forms, and;
(f) setting said concrete.

**4,314,431**
**MORTAR-LESS INTERLOCKING BUILDING BLOCK SYSTEM**
**Ernest A. Rabassa, Miami, Fla., assignor to S & M Block System of U.S. Corporation, Miami, Fla.**
**Filed Dec. 31, 1979, Ser. No. 108,350**
**Int. Cl.³ E04B *2/00*; E06B *1/00***
**U.S. Cl. 52—259** **1 Claim**



1. In a mortarless building wall assembly of interlocking wall block members, the combination comprising, a first plurality of standard building blocks, each of which has body portion in the shape of an elongated rectangular prism, each standard building block being integrally formed with a protrusion extending longitudinally and centrally along one side thereof and being formed with slot extending longitudinally and centrally within and along the opposite side thereof, said protrusion and said slot being of complemental interfitting cross-sectional shape to provide for face-to face interlocking disposition of a first course of said standard blocks with respect to a second course thereof in a wall structure, a second plurality of tie beam blocks, each tie beam block of which has a body portion in the shape of an elongated rectangular prism, each tie beam block being formed with a first concrete forming slot extending longitudinally and centrally along one side thereof and a second slot extending longitudinally and centrally within and along the opposite side thereof, said second slot and said protrusion of said standard building block being of complemental interfitting cross-sectional shape to provide for face-to-face interlocking disposition of a course of said tie beam blocks with respect to the top course of said standard blocks in a wall structure, and a third plurality of column blocks, each of which column blocks has a body portion in the shape of an elongated rectangular prism, each column block being formed with a protrusion extending longitudinally and centrally along one side thereof to a distance of about one-half of said column block length, and being formed with a slot extending longitudinally and centrally within and along the opposite side thereof and substantially coextensive with respect to said column block protrusion, said column block protrusion and slot being of complemental interfitting cross-sectional shape to provide for face-to-face interlocking disposition of a vertical column of said column blocks interspaced with end portions of alternate courses of said standard building blocks and the other one-half of said column block including a through opening extending between said one side and said opposite side thereof and further including a plurality of cube blocks fitted between outwardly projecting end portions of a plurality of vertical column block interspaced with end portions of alternate courses of said standard building blocks, said cube blocks being formed with side-to-side through openings in registry with said through openings of said column blocks when so interspaced

therewith to provide a continuous, internal, vertical void for the reception of concrete for strengthening purposes.

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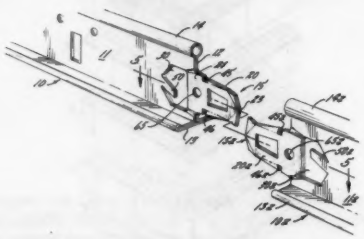
**4,314,432**

## SPLICE FOR BEAM IN SUSPENDED CEILING SYSTEM

**Per Rosenbaum, Woodbine, Md., assignor to Roper Corporation, Kankakee, Ill.**

**Filed Mar. 17, 1980, Ser. No. 130,985**
**Int. Cl.³ E04B 5/55; F16B 7/22**
**U.S. Cl. 52—484** **7 Claims**



1. In a suspended ceiling system, a pair of companion beams joinable end to end in aligned relation, each of the beams having a vertical web and a lower flange at right angles thereto, the beams having identically formed end portions each terminating in a horizontal tongue having a tip and upper and lower edges and anchored at a base portion which is an integral extension of the web, each web having formed therein a window aligned with the adjacent tongue and having a far edge and a near edge, the window having a vertical dimension just slightly greater than the height of the tongue, the window being spaced inwardly from the end of the web so that the near edge of the window defines a marginal portion of the web with the near edge of the window serving in addition as an inwardly spaced locking edge, means at the far edges of the windows for guiding the tongues of the beams simultaneously into their respective windows until the two beams abut one another and until the base portion of each tongue lies against the marginal portion of the companion beam, each marginal portion being offset from the plane of the associated web by an amount equal to substantially one-half of the web thickness to insure that when assembled the webs and flanges are coplanar and in perfect alignment with one another, each of the tongues being notched and bent along its upper and lower edges to form a pair of integral hooks, the hooks being spaced from the end of the web by an amount equal to the inward spacing of the locking edge, each tongue being sufficiently straight with respect to the plane of the web so that the tongue upon being received in the window of the companion beam is bent and bears with resilient lateral force against the far edge of the window causing the hooks to catch behind their locking edges to a predetermined reliable depth while permitting the tongues to be withdrawn from the windows by a withdrawing force applied at an angle with a lateral component in a direction to bendingly stress the tongues for disengagement of the hooks.

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**4,314,433**

## ROOF TILE FIXING CLIP

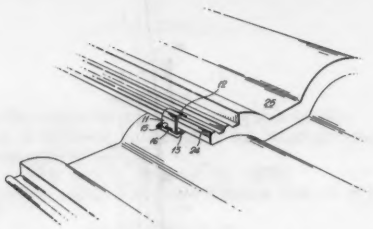
**Barry J. Hulcombe, Brisbane, Australia, assignor to Monier Colourtile Pty. Ltd., Darra, Australia**

**Filed Nov. 7, 1979, Ser. No. 92,043**
**Claims priority, application Australia, Nov. 13, 1978, PD6736**
**Int. Cl.³ E04D 1/34**
**U.S. Cl. 52—521** **7 Claims**

1. A method of fixing sequentially mounted lower and upper roofing tiles to a roof structure including the steps of:

(a) laying a lower tile on a tiling batten;

(b) passing a fastener having a head and a shank through an aperture in the lower tile attaching the lower tile to the tiling batten, spacing the head of said fastener above the upper face of the lower tile and associating said head with a clip having a body, foot and hook means engaging an upper tile overlapping said lower tile providing, said foot with a slot through which the shank of the fastener is passed when the lower tile is attached to the tiling batten,



communicating said slot with an aperture in the body providing clearance for the passing of the head of the fastener;

(c) attaching the lower tile to the tiling batten by fastening said fastener to the batten whereby the head of the fastener abuts said slot of said clip; and

(d) engaging said upper tile with the hook means of said clip.

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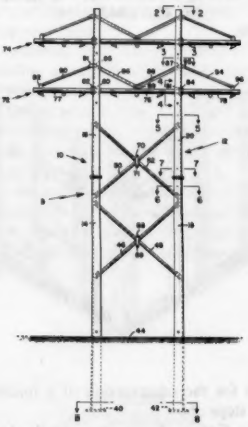
**4,314,434**

## UTILITY LINE SUPPORT STRUCTURE

**Raymond F. Meisberger, c/o Bruce-Lake Co., Box 550, Coatesville, Pa. 19320**

**Filed Jul. 7, 1977, Ser. No. 813,677**
**Int. Cl.³ E04C 3/30**
**U.S. Cl. 52—721** **11 Claims**



1. A metal electric power line support structure for supporting electric power transmission lines above the ground comprising:

a pair of legs extending upwardly with respect to the ground,

the legs being adapted to be supported on the ground so that upper portions of the legs are in spaced apart relationship,

and a cross-arm connected between and extending outwardly from the upper portions of said legs for supporting electric power transmission lines and the like,

each of said legs comprising a structural element having a web,

a pair of side walls extending at right angles to said web,

and a pair of inturned flanges extending at right angles to each side wall,

said inturned flanges being parallel to the web and having edges defining a slot therebetween so that said legs are generally C-shaped,

each of said legs having a web and side walls that are tapered and include a plurality of sections connected in end-to-end relation.

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4,314,435

## FOLIAGE TRIMMER

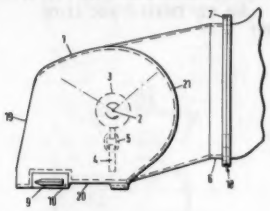
Alfred Schmidt, St. Blasien, Fed. Rep. of Germany, assignor to Alfred Schmidt GmbH, St. Blasien, Fed. Rep. of Germany

Filed May 28, 1980, Ser. No. 154,118

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1979, 2947511

Int. Cl.³ A01D *55/02, 55/22, 57/00*

U.S. Cl. 56—13.3 8 Claims



1. Apparatus for trimming foliage comprising a housing having an opening along its bottom and mounted at the end of a hose connected to a source of suction, a fly-cutter rotatably mounted within said housing and a bar cutter mounted within said opening, and forming the lower front edge of said housing said bar cutter extending parallel to the axis of rotation of said fly-cutter and adjacent to the plane of the bottom of said housing, and a plate mounted to the bottom of said housing to the rear of said bar cutter to enclose said housing and cause the material cut by said bar cutter to be engaged by said fly-cutter and thereby subsequently cut into small pieces.

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4,314,436

## MOWING MACHINE

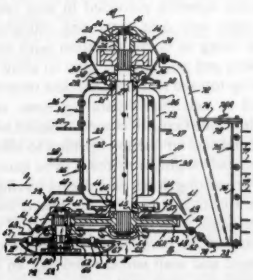
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Continuation of Ser. No. 941,321, Sep. 11, 1978, Pat. No. 4,233,805. This application Jun. 9, 1980, Ser. No. 157,381

Claims priority, application Netherlands, Sep. 19, 1977, 77.10240

Int. Cl.³ A01D *55/262*

U.S. Cl. 56—13.6 6 Claims



1. A mowing machine comprising a frame extending transversely to the intended operational direction of travel of the machine and a row of mowing elements having shafts mounted for rotation about upwardly extending axes in said frame, said frame having a first frame part extending over said row of mowing elements, at least two rotors situated underneath said first frame part but at a higher level than said mowing elements, said rotors rotating about upwardly extending axes, said first frame part comprising first drive means extending from one of said rotors to another one of said rotors, a second drive means arranged at a lower level than said rotors arranged to drive a plurality of said mowing elements which have their rotary axes spaced a distance from said axes of said rotors, a second frame part interconnecting said shafts on said mowing elements which is arranged at a lower level than said rotors, the axes of said rotors and said mowing element having a fixed relationship.

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4,314,437

## SPLICING DEVICE

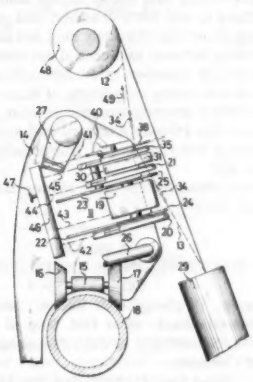
Joachim Rohner, and Heinz Zumfeld, both of Mönchengladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Mönchengladbach, Fed. Rep. of Germany

Filed Jan. 24, 1980, Ser. No. 114,883

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1979, 2902988

Int. Cl.³ B65H *69/06*

U.S. Cl. 57—22 9 Claims



1. Splicing assembly, comprising a splicing device including a pneumatic thread splicer for joining an upper thread to a lower thread and a testing device for monitoring the tensile strength of the splice.

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4,314,438

## SPINNING UNIT FOR OPEN-END SPINNING MACHINE

Noriaki Miyamoto; Masao Shiraki, both of Kariya, and Kinpei Mitsuya, Aichi, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Nov. 5, 1979, Ser. No. 91,496

Claims priority, application Japan, Nov. 13, 1978, 53/156538; Nov. 13, 1978, 53/156539

Int. Cl.³ D01H *7/882*

U.S. Cl. 57—58.89 3 Claims

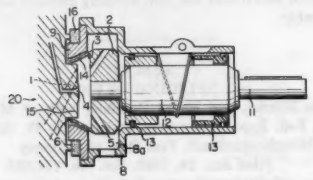
1. A spinning unit for an open end spinning machine, said unit comprising:

a rotor including a short cylindrical portion defining a large central aperture, a frustoconical portion defining a rotor chamber and having a first end connected to said cylindrical portion, and a bottom portion closing said rotor chamber and connected to a second end of said frustoconical portion, said frustoconical portion diverging from said first end thereof to said second end thereof;

a casing surrounding said rotor and having connected first and second portions, said second portion surrounding said bottom portion of said rotor and defining therewith an annular chamber;

said bottom portion of said rotor having therein air discharge opening means extending from said rotor chamber to said annular chamber for, upon rotation of said rotor, discharging air and accompanying debris from said rotor chamber into said annular chamber, and for thereby creating a negative pressure condition in said rotor chamber and a positive pressure condition in said annular chamber;

said first portion of said casing having an inner surface substantially outwardly surrounding both said cylindrical and



frustoconical portions of said rotor in spaced relation therewith to thereby define therebetween passage means for preventing said debris in said annular chamber from returning to said rotor chamber, said passage means comprising an annular relatively long and narrow bent passage extending between said central aperture of said rotor and said annular chamber, said inner surface of said first portion of said casing comprising at least one diverging surface portion opening into said annular chamber, said surface portion extending toward said annular chamber and diverging away from said frustoconical portion of said rotor; and

stationary means for openably closing said central aperture of said rotor.

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**4,314,439**

## DEVICE FOR CHARGING A TEXTILE MACHINE WITH COIL TUBES

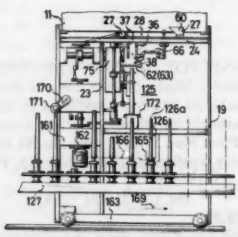
**Heinz Kamp, Wegberg; Rolf Becker, and Manfred Stops, Monchen-Gladbach, all of Fed. Rep. of Germany, assignors to W. Schalfhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany**

**Filed Dec. 21, 1979, Ser. No. 105,959**

**Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2856027**

**Int. Cl.³ D01H** *9/00, 9/10*

**U.S. Cl. 57—270** **27 Claims**



1. Device for loading a textile machine with individual conical coil tubes, comprising a supply container for the individual conical coil tubes having a bottom with an opening formed therein, a chute disposed below said opening formed in the bottom of said supply container, reciprocating slider means including a transport compartment with an open top and bottom formed therein for receiving single coil tubes dropped through said opening formed in the bottom of said supply container, transporting the single coil tubes horizontally and dropping the single coil tubes into said chute, a feed station disposed below said chute for receiving unsorted conical coil tubes, means for successively slipping individual conical coil tubes onto spindles or creel mandrels of a textile machine, and controlled coil tube turning means for passing on a conical coil tube presented in unsorted condition at said feed station to said slipping on means with tips sorted.

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**4,314,440**

## DUST REMOVING MECHANISM IN OPEN-END SPINNING FRAME

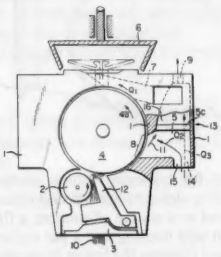
**Keiji Onoue, Kariya; Takashi Katoh, Toyota; Yoshiaki Yoshida, Ohbu, and Kazuo Seiki, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan**

**Filed Apr. 9, 1980, Ser. No. 138,519**

**Claims priority, application Japan, Apr. 11, 1979, 54-42964**

**Int. Cl.³ D01H** *7/888, 11/00*

**U.S. Cl. 57—301** **10 Claims**



1. In an open-end spinning unit including a casing having a cylindrical space, a cylindrical opening roller rotatably disposed within said space to open a sliver into individual fibers and deliver the opened fibers into a twisting region, and a dust removing mechanism incorporated in said spinning unit and having a dust removing chamber to receive dust removed from the fibers and discharge it out of said dust removing chamber, said dust removing mechanism comprising a dust removing opening provided in said casing so as to communicate with both said cylindrical space and said dust removing chamber, means partitioning said dust removing chamber into a dust separating zone and a dust discharge promoting zone connected together at a position downstream of said dust removing opening with respect to a direction of rotation of said opening roller, a first and a second air inlet provided in said casing so as to communicate with said dust removing chamber, and an air suction opening provided in said casing so as to communicate with said dust removing chamber, said dust separating zone being in communication with both said dust removing opening and said first air inlet to allow an auxiliary air stream flowing toward and into said dust removing opening to be generated in said dust separating zone, said dust discharge promoting zone being in communication with both said second air inlet and said air suction opening to allow a substantially linear, dust discharging air stream to be generated in said dust discharge promoting zone, said casing having an inclined inner wall spaced from said partitioning means and inclined at a predetermined angle with respect to an axis of said opening roller; the improvement comprising said partitioning means having an inclined end wall surface defining an intermediate passage in conjunction with said inclined inner wall of said casing and which is inclined with respect to the axis of said opening roller at a predetermined angle smaller than said predetermined angle of said inclined inner wall, whereby dust in

said dust separating zone is introduced through said intermediate passage into said dust discharge promoting zone.

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**4,314,441**

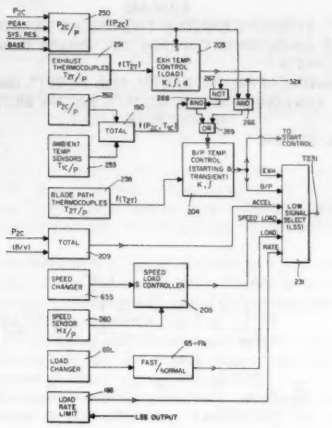
## GAS TURBINE POWER PLANT CONTROL APPARATUS INCLUDING AN AMBIENT TEMPERATURE RESPONSIVE CONTROL SYSTEM

**Robert A. Yannone, Aldan, and James J. Shields, Philadelphia, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Continuation of Ser. No. 817,932, Jul. 22, 1977, abandoned. This application Jun. 1, 1979, Ser. No. 44,615**

**Int. Cl.³ F02C *9/32***

**U.S. Cl. 60—39.28 R** **12 Claims**




1. A gas turbine electric power plant comprising:

a. a gas turbine having a compressor, and combustion and turbine elements;

b. a fuel system for supplying fuel to said gas turbine combustion element;

c. means for operating said fuel system under control, to provide a controlled flow of fuel to said combustion element;

d. means for generating an actual ambient temperature signal, a blade plate temperature signal and a combustor shell pressure signal, a control system having a plurality of control paths each of which produces a respective control path signal, said plurality including a backup blade path temperature control independent of any surge limit control included in said control system and having means for generating a limit signal as a function of both of said temperature signal generating means and said pressure signal generating means, said control system having means for continuously selecting one of the signals produced by said control paths on a predetermined basis; and

e. means for operatively connecting said selected signal to said operating means.

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**4,314,442**

## STEAM-COOLED BLADING WITH STEAM THERMAL BARRIER FOR REHEAT GAS TURBINE COMBINED WITH STEAM TURBINE

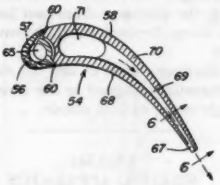
**Ivan G. Rice, P.O. Box 233, Spring, Tex. 77373**

**Continuation-in-part of Ser. No. 954,838, Oct. 26, 1978. This application Jun. 11, 1979, Ser. No. 47,571**

**Int. Cl.³ F01B *5/18*; F02C *7/16***

**U.S. Cl. 60—39.05** **17 Claims**

1. In the production of useful power wherein compressed heated gas is produced for contacting turbine blading for rotating a turbine shaft, and said turbine blading is cooled, the improvement comprising; introducing steam into the interior of said blading, directing steam from the interior of said blading substantially tangentially onto the exterior surfaces of said blading, the relative velocity of said steam directed onto the surface of said blading being substantially zero with respect to



the velocity of said compressed heated gas contacting said blading, whereby the external surface of said blading is covered with a thermal barrier of steam which insulates the blading against radiant and convection heating.

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**4,314,443**

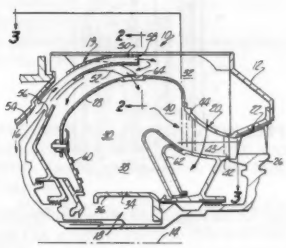
## TURBINE ENGINE CONSTRUCTION

**Dennis E. Barbeau, Liberty Center, Ohio, assignor to Teledyne Industries, Inc., Los Angeles, Calif.**

**Filed Nov. 8, 1978, Ser. No. 958,544**

**Int. Cl.³ F02C *3/14***

**U.S. Cl. 60—39.36** **5 Claims**



1. A turbine engine construction comprising a support housing, a compressor means, combustor means and a turbine expander means within the support housing, said compressor means having a compressed air outlet open to the combustor means and said combustor means having an outlet open to the turbine expander means, a diffuser means for fluidly connecting said compressor means outlet to said combustor means, said diffuser means including ducting means for discharging compressed air from the compressor outlet into the combustor means at at least two discharge planes;

wherein said diffuser means further comprises at least two diffuser tubes, each tube having a first end open to and in registration with the compressor outlet, and each tube having a second end open to the combustor means, said second ends of the tubes being open to the combustor means at different discharge planes in the combustor means;

wherein the discharge plane of at least one tube is angled with respect to the discharge plane of the other tube;

wherein said combustor means further comprises a housing defining a combustion chamber within said combustor housing and a further chamber between said support housing and said combustor housing, at least one of said diffuser tubes exhausting the compressor output into said further chamber and at least one of said diffuser tubes exhausting its compressed air output through an opening in said combustion housing and into the combustion chamber;

said turbine engine including a nozzle between said combustor means and said expander means, wherein said combustor housing is annular in shape and wherein said last mentioned diffuser tube discharges compressed air radially inwardly into said combustion chamber and at a predetermined axial angle with respect to the axis of said combustor housing, the discharge from said last mentioned diffuser tube being directed generally toward the turbine nozzle; and

wherein the discharge angle of said last mentioned diffuser tube is substantially aligned in the direction of the discharge angle of the turbine nozzle.

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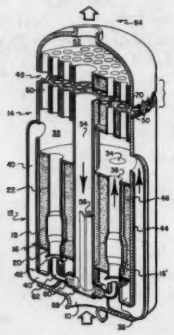
## 4,314,444

## HEATING APPARATUS

Abbott A. Putnam, and David W. Locklin, both of Columbus, Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Jun. 23, 1980, Ser. No. 161,802
Int. Cl.[3] F02C 5/11
U.S. Cl. 60—39.77 8 Claims



1. Apparatus for burning a fuel and a combustion-sustaining gas, at least one of which contains nitrogen, and for imparting the heat generated thereby to a heat-transfer medium, comprising

a first combustion stage including a pulse combustor for burning a mixture of the fuel and the gas, comprising a combustion chamber, aerodynamic valve inlet means, and a resonance-tube outlet means, to operate in a periodic cycle including one phase wherein a major portion of combustion gases is driven out of the combustion chamber through the outlet means and a minor portion is driven out of the combustion chamber so as to produce a backflow through the aerodynamic valve means, and another phase wherein a fresh charge of the combustion-sustaining gas is ingested by the combustor through the aerodynamic valve means,

means for supplying the combustion-sustaining gas to the aerodynamic valve means and thence to the pulse combustor,

means for supplying fuel to the pulse combustor so as to provide an excess of fuel in relation to the amount of combustion-sustaining gas ingested by the pulse combustor,

a second combustion stage including means for receiving the combustion gases from the pulse combustor outlet means and for burning the excess of fuel to produce terminal combustion products,

means utilizing the backflow for aspirating combustion-sustaining gas and for delivering the aspirated gas to the second stage for burning with the excess of fuel received there,

intercooling means utilizing a heat-transfer medium for extracting from the pulse combustor in the first stage a substantial portion of the heat generated therein,

means utilizing a heat-transfer medium for extracting most of the heat from the terminal combustion products produced by the second stage so as to produce substantially cooled combustion products,

means for recirculating a portion of the cooled combustion products to the pulse combustor so as to dilute the combustion-sustaining gas supplied thereto, and

means for exhausting the remainder of the cooled combustion products with only a low content of objectionable compounds formed from the nitrogen in the fuel and the combustion-sustaining gas.

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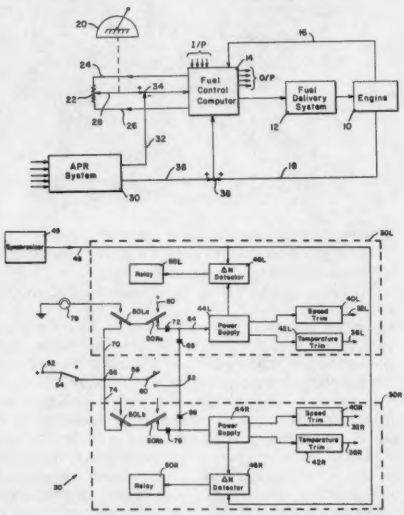
## 4,314,445

## TURBINE ENGINE THRUST BOOSTER

Leon D. Lewis, 28619 Coveridge Dr., Rancho Palos Verdes, Calif. 90274

Continuation of Ser. No. 842,751, Oct. 17, 1977, abandoned.
This application Aug. 20, 1979, Ser. No. 68,279
Int. Cl.[3] F02K 3/12
U.S. Cl. 60—204 30 Claims




1. In combination:

an engine having a normal maximum thrust level and emergency maximum thrust level;

means for controlling engine fuel delivery to adjust engine thrust within a range having an upper limit not greater than said emergency maximum thrust level;

means for generating engine thrust trim signals for limiting engine thrust to said normal maximum thrust level;

means for energizing said trim signal generating means;

means for producing an output signal indicative of engine malfunction; and

means, responsive to said engine malfunction output signal, for controlling the application of said trim signals to said fuel delivery control, said trim signal application controlling means interposed between said trim signal generating means and said energizing means for selectively disconnecting said trim signal generating means from said energizing means.

## 4,314,446
## EXHAUST SKIMMING

James E. Bull, Denton, Tex., assignor to Texas Woods Instruments, Inc., Red Oak, Tex.

Filed Sep. 26, 1979, Ser. No. 79,175
Int. Cl.³ F02M 25/06
U.S. Cl. 60—279 14 Claims

1. An exhaust gas treatment system for a combustion chamber, comprising

an exhaust conduit from a combustion chamber, having a first portion disposed in substantially a straight line;

an expansion chamber connected in a straight line with said exhaust conduit first portion, at a first end thereof, and having a second end, opposite said first end;

a second substantially straight line portion of said exhaust conduit, connected in a straight line with said expansion chamber second end;

said expansion chamber having a cross-sectional area 110% to 200% as large as the cross-sectional area of said exhaust conduit first portion, and at least 110% to 200% of the cross-sectional area of said exhaust conduit second portion;

means for defining a plurality of openings in said expansion chamber in first and second series, the first series disposed substantially 180° from the second series along the circumference of said expansion chamber;

means for mounting said expansion chamber so that a plane containing said first and second series of openings in said expansion chamber is generally vertical;

pick-off conduit means operatively associated with said openings in said expansion chamber and for returning gases passing through said openings from said expansion chamber to said combustion chamber; and

filtering means disposed in said conduit means between said expansion chamber and combustion chamber for, at least, separating excess liquid out of the returning gases.

## 4,314,447
## REFRIGERANT MOTOR

Kenneth P. Gray, E. Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 2, 1979, Ser. No. 53,875
Int. Cl.³ F01K 25/00; F01L 25/02
U.S. Cl. 60—671 3 Claims

1. A motor adapted to convert energy from a stream of gaseous refrigerant flowing through a closed circuit having a high temperature source and a low temperature sink which comprises:

a casing defining a chamber;

a flexible diaphragm dividing the chamber into a driving chamber and an equalizing chamber;

a rod connected to reciprocate with the diaphragm;

a port for allowing gaseous refrigerant to flow into and out of the driving chamber;

a spool valve having a valve casing defining a valve chamber and having:

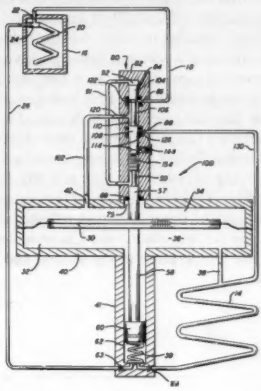
(a) an inlet valve port for the receipt of gaseous refrigerant from the refrigeration circuit;

(b) a common valve port for the discharge and receipt of gaseous refrigerant from the entry port of the driving chamber; and

(c) An exit port for the discharge of gaseous refrigerant to the refrigeration circuit;

a spool located within the valve chamber having a spool middle portion which communicates inlet valve port with the common port when the spool is in a first position and the common port with the exit port when the spool is in a second position;

a valve actuator connected to the diaphragm, said valve actuator having an end which engages the end of the spool to move the spool from the second position to the first position and has a spool portion connected to a pilot line



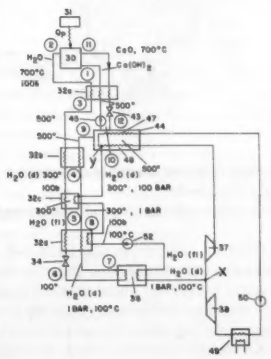
for allowing gaseous refrigerant to enter a pilot chamber portion of the valve chamber for displacing the spool from the first position to the second position, said spool portion communicating the driving chamber with the pilot chamber through a pilot line; and

a pump connected to the rod for circulating refrigerant within the closed circuit.

## 4,314,448
## THERMODYNAMIC PROCESS FOR EXPLOITING HIGH-TEMPERATURE THERMAL ENERGY

Georg Alefeld, Josef-Raps-Strasse 3, 8000 Munich 40, Fed. Rep. of Germany

Filed Aug. 14, 1978, Ser. No. 933,578
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1977, 2737059
Int. Cl.³ F01K 21/00, 25/00
U.S. Cl. 60—673 20 Claims



1. A thermodynamic process for raising the efficiency of a thermal power station containing a main section operating on the principle of the Clausius-Rankine process and doing work as well as an additional section operating on the principle of a heat pump, in which the multiple-substance working medium is decomposed by primary heat at a temperature in a first high-

temperature range by this high-temperature thermal energy into a condensed (solid or liquid) first component and a gaseous second component and the resulting gaseous component is transformed into a condensed state, is then returned to the gaseous state and finally again united with the condensed component of the multiple-substance working medium, characterized in that the multiple-substance working medium comprises combinations of $CaO/H_2O$ and metal/hydrogen, where the term metal includes metallic chemical elements and alloys which combine with hydrogen under positive heat of reaction, and that condensation occurs at a temperature in a second temperature range below the first high-temperature range, in that transfer into the gaseous state occurs at a temperature in a third temperature range below the second temperature range, and in that union occurs at a temperature in a fourth temperature range lying between the first and the third temperature ranges but differing from the second temperature range, and in that the amounts of thermal energy released during condensation and union are admitted to the Clausius-Rankine process at essentially the temperature in the second and fourth temperature ranges.

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**4,314,449**

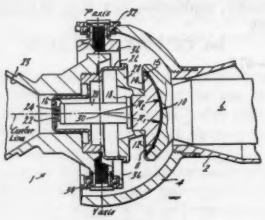
## NON-CONTACTING THERMAL ENERGY TRANSFER ASSEMBLY

**Elias Reisman, Orange; David S. Goodsell, and Fred S. Masino, both of Costa Mesa, all of Calif., assignors to Ford Aerospace & Communications Corp., Dearborn, Mich.**

**Division of Ser. No. 966,972, Dec. 6, 1978. This application Aug. 20, 1980, Ser. No. 179,927**

**Int. Cl.³ F25B *21/02***

**U.S. Cl. 62—3** **5 Claims**



1. A radiation detector assembly comprising:
a relatively fixed body;
a thermoelectric cooler having defined hot and cold conductors;
a gimbal assembly attached to said fixed body for mounting said thermoelectric cooler and detector element to provide relative movement about two orthogonal axes;
a heat sink mounted within said relatively fixed body;
means for transferring heat from said relatively movable hot conductor to said heat sink, which includes:
a first low thermal resistivity element mounted on said hot conductor;
a second low thermal resistivity element mounted within said body in contact with said heat sink; and
a gaseous fluid medium having a low thermal resistivity located between said first and second elements to provide a non-contacting thermal conducting path therebetween.

**4,314,450**

## CRYOGENIC STORAGE DEVICES

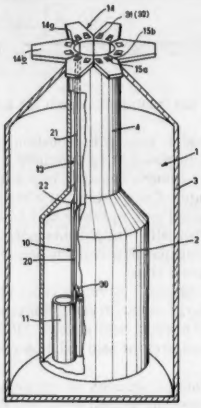
**Pierre Pelloux-Gervais, Grenoble, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France**

**Filed Sep. 4, 1980, Ser. No. 184,186**

**Claims priority, application France, Sep. 28, 1979, 79 24212**

**Int. Cl.³ F17C *7/00***

**U.S. Cl. 62—45** **7 Claims**



1. In a device for storing material at low temperature, comprising a cryobiological tank having an internal container insulated by a sheath joined to a neck of said internal container, the upper end of said neck forming a rim, a plurality of carrying cases with canisters to accommodate material to be stored at low temperature, each carrying case having a canister rod that extends up from the canister and through said neck and out over said rim and rests on said rim, and a closure plug that fits in said neck to close the tank; the improvement in which each said canister rod has a head that extends radially outwardly and rests on said rim, said heads of said canister rods together covering the supporting area present on said rim.

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**4,314,451**

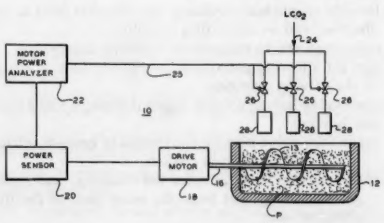
## CONTROLLING TEMPERATURE OF A CRYOGENICALLY REFRIGERATED PRODUCT

**Richard L. Leeds, Metuchen; Jeffrey A. Montross, Bloomfield, both of N.J., and Richard J. Barbini, Islip Terrace, N.Y., assignors to Airco, Inc., Montvale, N.J.**

**Filed Oct. 27, 1980, Ser. No. 200,626**

**Int. Cl.³ F25C *1/18***

**U.S. Cl. 62—68** **7 Claims**




1. A method for controlling the temperature to which a product is chilled in a blender having a rotatable impeller adapted to be driven by an electric motor comprising the steps of introducing solid $CO_2$ into said blender and into contact

with said product; energizing said motor to drive said impeller, thereby mixing said solid $CO_2$ with said product to chill the same, the improvement comprising the steps of:

sensing the electrical power drawn by said motor; comparing the sensed power with a predetermined power value and terminating the introduction of solid $CO_2$ into the blender upon the actual power drawn by said motor reaching said predetermined value.

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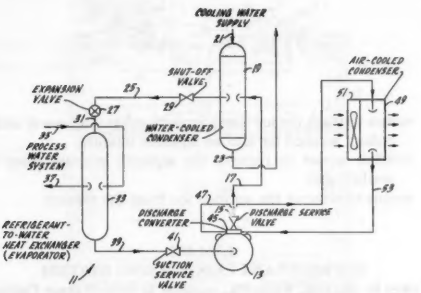
**4,314,452**

## COMPRESSOR DISCHARGE CONVERTER

**Michael A. Waters, Elk Grove Village, Ill., assignor to Application Engineering Corporation, Elk Grove Village, Ill.**

**Filed Jul. 28, 1980, Ser. No. 172,956**
**Int. Cl.³ F25B *45/00, 27/02***
**U.S. Cl. 62—77** **5 Claims**




1. In a process fluid chilling system of the kind comprising a compressor, a discharge service valve mounted on the discharge port of the compressor, a condenser and a refrigerant-to-process fluid heat exchanger connected together in the stated sequence by refrigerant conduits, the improvement comprising a compressor discharge converter for connecting a second condenser into the system in series, comprising:

a housing mountable on the compressor interposed between the compressor outlet and the discharge service valve, the housing comprising first and second separate transfer chambers, each chamber having a central port at the center of the converter and an external port at the periphery of the converter, the central port of the first transfer chamber connecting directly to the compressor discharge port and the central port of the second transfer chamber connecting directly to the discharge service valve,

the central port of each transfer chamber being connected to the external port of that chamber by a plurality of small tunnel passages thereby affording a thin, flat configuration for the converter;

and conduit means connecting the external ports of the converter to a second condenser so that the second condenser is connected in the system in series with the first condenser.

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**4,314,453**

## ONE AND A HALF BAND REFRIGERATED DISPLAY CASE

**Fayez F. Abraham, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.**

**Continuation-in-part of Ser. No. 60459, Jul. 25, 1979, and Ser. No. 70,882, Aug. 29, 1979. This application Sep. 18, 1979, Ser. No. 76,669**
**Int. Cl.³ F25D *21/12***
**U.S. Cl. 62—82** **22 Claims**

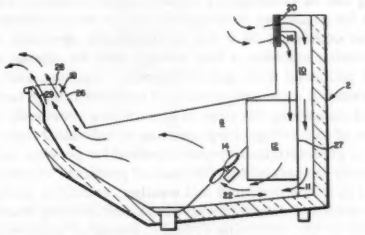
1. A refrigerated display case for displaying refrigerated products, said display case comprising:

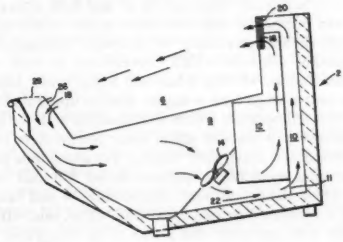
a cabinet having an interior display space and an access opening for enabling access to refrigerated products within said display case;

a first air conduit extending around said cabinet so as to have an inlet opening at one end of said access opening and an outlet opening at the other end of said access opening, said inlet and outlet openings being aligned so that air leaving said outlet opening is directed across said access opening and received by said inlet opening;

refrigeration means including an evaporator coil arranged within said first air conduit for refrigerating air passing through said first air conduit;

air circulating means arranged within said first air conduit for circulating air through said first air conduit in a forward direction during a refrigeration cycle of operation so that air is expelled from said outlet opening, travels across said access opening and returns into said first air conduit through said inlet opening and for circulating such air in a reverse direction during a defrost cycle of operation so that air is expelled through said inlet opening;





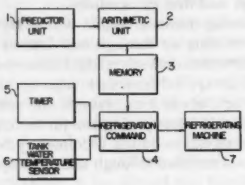
a second air conduit extending partially around said cabinet in a position lying outwardly of said first air conduit, said second air conduit having an outlet opening arranged adjacent to said outlet opening of said first air conduit and an air inlet opening located so that during a refrigeration cycle of operation such inlet opening receives air passing through said first air conduit before such air passes through said refrigeration means and said inlet opening of said second air conduit being positioned such that a reverse air flow through said second air conduit during a defrost cycle of operation will flow in contact with a portion of said evaporator coil; and

control means for switching between a refrigeration cycle of operation and a defrost cycle of operation and during such defrost cycle of operation temporarily terminating the operation of said refrigeration means and causing said air circulating means to circulate air through said first air conduit in a reverse direction for causing ambient air to be drawn into said outlet openings of said first and second air conduits and circulated through said first and second air conduits.

## 4,314,454
## METHOD OF OPERATING REFRIGERATING MACHINE

**Kohji Kamejima; Minoru Kano; Hideki Tanaka, and Toshihiko Fukushima, all of Shimoinayoshi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jul. 1, 1980, Ser. No. 164,945**
**Claims priority, application Japan, Jul. 4, 1979, 54/83984**
**Int. Cl.³ F25D *3/00, 17/02***
**U.S. Cl. 62—98** **1 Claim**




1. A method of operating a refrigerating machine of a refrigerating and air-conditioning system which includes predicting means for predicting variations in load to be conditioned and weather conditions on a day scheduled for operation of said refrigerating machine, a heat storage tank for storing energy output produced from said refrigerating machine, and means for measuring water temperature of said heat storage tank, said method comprising the steps of determining previously output powers of said refrigerating machine at individual time points within a predetermined operation period for possible values of said water temperature on the basis of predicted values of said load to be conditioned and said weather conditions; storing the thus determined output powers of said refrigerating machine in memory means; retrieving optimum output of said refrigerating machine from those stored in said memory means on the basis of actual water temperature of said heat storage tank at any given one of said individual time points within said operation period; and producing an operation command to said refrigerating machine which corresponds to said retrieved optimum output, wherein when said actual water temperature of said heat storage tank is higher than an upper limit value of said water temperature which is compatible with the load to be conditioned or when said actual water temperature is likely to rise beyond said upper limit value at any given time point, said refrigerating machine is operated under full-load condition, while when said actual water temperature of said heat storage tank is not higher than said upper limit value, said refrigerating machine is so operated that a sum of an integrated value of electric power consumed by said refrigerating machine and associated auxiliary equipments during said operation period and electric power carried over to the next day can be reduced to a minimum.

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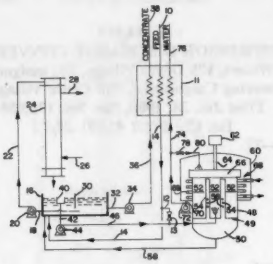
## 4,314,455
## FREEZE CONCENTRATION APPARATUS AND PROCESS

**Gerald E. Engdahl, Wheaton, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.**

**Filed Jun. 16, 1980, Ser. No. 160,002**
**Int. Cl.³ B01D *9/04***
**U.S. Cl. 62—124** **10 Claims**

1. A freeze concentration apparatus comprising:
a cold concentrator tank having upper and lower portions;
a conduit means to deliver an aqueous liquid mixture feed stream to the cold concentrator tank;
means to feed the liquid mixture from the cold concentrator tank to a freeze exchanger for indirect cooling by heat exchange to a cold fluid to form ice crystals in the liquid mixture;
means to feed the liquid mixture containing ice crystals from the freeze exchanger to the cold concentrator tank to separate an ice slurry in the cold concentrator tank upper portion on top of liquid mixture;
conduit means to withdraw liquid mixture from the cold concentrator tank lower portion concentrated by the freezing of water therefrom;
means to withdraw an ice slurry from the cold concentrator tank upper portion and deliver it to an ice slurry washer;



means to wash the ice slurry in the washer with water and to collect washed ice and an aqueous mixture;
conduit means to remove the aqueous mixture from the washer; and
means to remove the washed ice from the washer.

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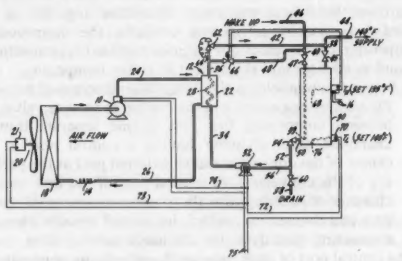
## 4,314,456
## REFRIGERANT CONDENSING SYSTEM

**James R. Harnish, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.**

**Filed May 5, 1980, Ser. No. 146,716**
**Int. Cl.³ F25D *17/00*; F25B *27/02***
**U.S. Cl. 62—181** **7 Claims**




1. A refrigerant condensing system for heating water including a compressor, a water-cooled condenser, an expansion device, and an evaporator coil, all suitably interconnected to form a closed refrigeration circuit, said system comprising in combination:
said condenser having a chamber with a coil disposed therein in heat exchange relationship, the coil having a water inlet and a water outlet;
a storage tank having a substantially unbaffled interior chamber, a high temperature inlet connected to its upper part, a lower temperature inlet connected to its bottom part, a hot water supply line, and an outlet;
pump means for circulating the water to be heated from the storage tank to the water inlet of the coil;
thermostatically-operated valve means operatively connected to the water outlet of the coil for permitting water to flow into the upper part of the tank in response to a pre-selected temperature, said valve means being operative to prevent unrestricted flow of water until the temperature of such water is at or above a predetermined temperature; and

by-pass valve means operatively connected to the water outlet of the coil for by-passing directly the water flow from the high temperature inlet of the tank to the lower temperature inlet when the upper portion of the tank is filled with water of the pre-selected temperature.

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**4,314,457**

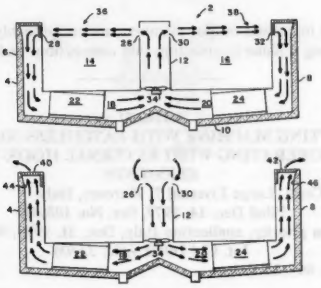
## ISLAND REFRIGERATED DISPLAY CASE WITH AIR DEFROST

**Fayez F. Ibrahim, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.**

**Continuation-in-part of Ser. No. 11,804, Feb. 14, 1979, Ser. No. 60,459, Jul. 25, 1979, Ser. No. 76,669, Sep. 18, 1979, and Ser. No. 107,261, Dec. 26, 1979. This application May 1, 1980, Ser. No. 145,859**

**Int. Cl.³ A47F *3/04***

**U.S. Cl. 62—256** **26 Claims**



1. An island refrigerated display case comprising:

a cabinet having four outer walls and a bottom wall, first and second interior display spaces with a partition wall separating said display spaces, and an access opening associated with each of said display spaces for enabling access to refrigerated products within said display case;

a first refrigeration air conduit extending along one of said outer walls, said bottom wall and said partition wall of said cabinet so as to extend around said first interior display space and having an air inlet opening at one end of the associated said access opening and an air outlet opening at the other end of the associated said access opening, said inlet opening and said outlet opening being aligned so that air leaving said outlet opening is directed across said access opening and received by said inlet opening so as to establish a refrigerated air curtain across said access opening;

a second refrigeration air curtain extending along the opposite of said outer walls, said bottom wall and said partition wall of said cabinet so as to extend around said second interior display space and having an air inlet opening at one end of the associated said access opening and an air outlet opening at the other end of the associated said access opening, said inlet opening and said outlet opening being aligned so that air leaving said outlet opening is directed across said access opening and received by said inlet opening so as to establish a refrigerated air curtain across said access opening;

air circulating means for circulating air through said first refrigeration air conduit and said second refrigeration air conduit;

refrigeration means for cooling air flowing through said first and second refrigeration air conduits during a refrigeration cycle operation of said display case;

control means for switching said display case between a refrigeration cycle of operation and a defrost cycle of operation and during such defrost cycle of operation temporarily terminating the operation of said refrigeration means and causing ambient air to be drawn into and flow through said first refrigeration air conduit and said second refrigeration air conduit for causing defrosting of any frost buildup within such conduits; and,

means for causing the ambient air during a defrost cycle of operation to be expelled from each of said refrigeration conduits so as to flow up and away from said display case along a path flowing over the outside of an outer wall of said cabinet so that such expelled ambient air is prevented from re-entering said refrigeration conduits.

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**4,314,458**

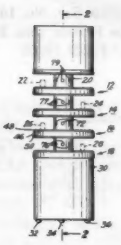
## REFRIGERATED DISPLAY CASE

**Conrad Hade, South Salem, and Dale D. Robinson, Spring Valley, both of N.Y., assignors to Dalcon Marketing Inc., Port Chester, N.Y.**

**Filed Oct. 1, 1980, Ser. No. 192,738**

**Int. Cl.³ A47F *3/04***

**U.S. Cl. 62—256** **25 Claims**



1. A refrigerated display case comprising:

(A) an upright vertically oriented rectilinear inner first duct,

(B) an upright vertically oriented rectilinear outer second duct, said second duct being disposed about and coaxial with said first duct, so that said first duct defines a central vertical passage for downwards flow of heated air, and so that the annular space between said first duct and said second duct defines an annular vertical passage for upwards flow of cold air,

(C) first and second spaced apart juxtaposed horizontal baffles, each baffle extending outwards from attachment to said outer duct, the first baffle being an upper baffle and the second baffle being a lower baffle,

(D) a middle horizontal baffle, said middle baffle being disposed between and spaced from said first and second baffles and extending outwards from attachment to said outer duct,

(E) said second duct having a first plurality of foramina spaced between the attachment of said first baffle and the attachment of said middle baffle, so as to permit lateral flow of cold air from the annular passage between said first duct and said second duct into and laterally outwards through the passage between said first baffle and said middle baffle,

(F) said second duct having a second plurality of foramina spaced between the attachment of said middle baffle and the attachment of said second baffle, so as to permit lateral flow of cold air from the annular passage between said first duct and said second duct into and laterally outwards through the passage between said middle baffle and said second baffle,

(G) a first plurality of tubular members, said first plurality of tubular members extending in the annular passage between said first duct and said second duct and above said first baffle, so as to provide a first through passage for warmed air above said first baffle and from external to said second duct to within said first duct,

(H) a second plurality of tubular members, said second plurality of tubular members extending in the annular passage between said first duct and said second duct and below

said second baffle, so as to provide a second through passage for warmed air below said second baffle and from external to said second duct to within said first duct,

(I) air refrigeration means, said air refrigeration means being disposed below the lower ends of said first and second ducts,

(J) means to pass warm air downwards through said first duct and from the lower end of said first duct into and through said air refrigeration means, so that the warm air is cooled, and

(K) means to pass the resulting cold air from said air refrigeration means into and upwards through the annular passage between said first duct and said second duct.

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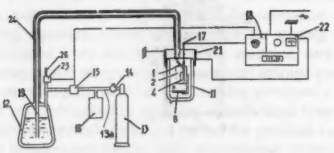
**4,314,459**

## STABLE AND PRECISE CRYOGENIC DEVICE

**Jacques Rivoire, 1201 Rue Rocqueturiere, Mas Albine, 34000 Montpellier, France**

**Filed Jun. 27, 1980, Ser. No. 163,798**
**Claims priority, application France, Jun. 28, 1979, 79 17285**
**Int. Cl.³ F25D *19/00***
**U.S. Cl. 62—514 R** **13 Claims**



**1.** A cryogenic apparatus comprising:

an open-top insulating receptacle;

a sample support in said receptacle for holding a sample to be subjected to a predetermined low temperature;

evaporating means for vaporizing a liquid cryogen disposed in the region of said support in said receptacle;

means responsive to temperature in said receptacle; and

control means for controlling the feed of said liquid cryogen to said evaporating means in response to said means responsive to temperature to establish said predetermined temperature and maintain the same solely by the control of the supply of said liquid cryogen to said evaporating means, said liquid cryogen being supplied to said evaporating means at a rate sufficient to maintain a pressure of the vaporized cryogen sufficient to exclude moisture-carrying air from said receptacle.

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**4,314,460**

## LINKED TORSIONAL MISALIGNMENT COUPLING

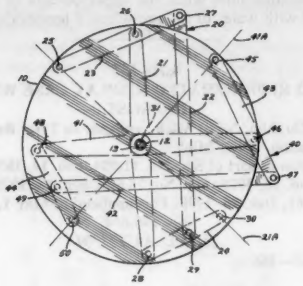
**Alfred B. Mayfield, c/o William R. Scarborough, 512 Nicollet Mall, #707, Minneapolis, Minn. 55402**

**Filed May 8, 1979, Ser. No. 37,004**
**Int. Cl.³ F16D *3/54***
**U.S. Cl. 64—19** **1 Claim**

**1.** A constant velocity flexible coupling comprising , in combination;

adjacently disposed input and output members each mounted upon a rotatable shaft;

at least a pair of linkage means for connection intermediate said input and output members, each of said linkage means including a main bar rotatably disposed on a pin, a first bar connecting one end to said input member, a second bar connecting the other end to said output member, said first bar being connected to a main bar intermediate its ends and said second bar being connected to a main bar at its opposite end and means interconnecting said first and second bar members, said last named means being connected to the opposite end of said first bar member and intermediate the ends of said second bar member whereby the ends of the first and second bar members connected to



the input and output members are reciprocably operable along a plane intersecting said connections and said pin.

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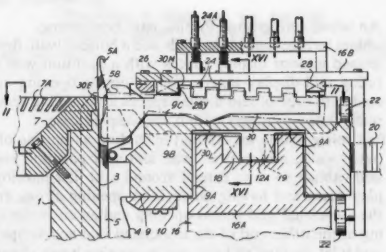
**4,314,461**

## KNITTING MACHINE WITH LATCHLESS NEEDLES COOPERATING WITH EXTERNAL HOOK-TYPE ELEMENTS

**Gianni Conti, Largo Liverani 7, Florence, Italy**

**Filed Dec. 14, 1979, Ser. No. 103,485**
**Claims priority, application Italy, Dec. 21, 1978, 9676 A/78**
**Int. Cl.³ D04B *9/02, 35/06***
**U.S. Cl. 66—13** **7 Claims**

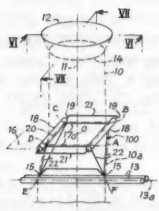


**1.** In a knitting machine, the improvement comprising latchless needles each having means defining a longitudinal slot therein and a yarn engaging member for engaging a stitch of a yarn, hook-type selector elements slidable generally perpendicularly to the needles and movable between raised and lowered positions along the length of the longitudinal slot of the needle, each selector element having a hooked end portion arranged to extend into the said longitudinal slot of an associated needle, and control means selectively operative to move the selector elements generally perpendicularly to the needles and to raise and lower the selector elements so that their hooked end portions can enter the slots in the associated needles, be raised in order to take-up the stitch engaged by the needle and to remove it therefrom, and then be lowered to remove the stitch by lowering the hooked end portion under the plane of formation of the fabric formed by intermeshing loops of the yarn, wherein each of said selector elements comprises butts, and means defining a fulcrum supporting the selector element for sliding movement perpendicularly to its associated needle and supporting the selector element for angular movement between raised and lowered positions, the butts of the selectors cooperating with the control means, and said control means being operable to selectively engage the butts on the selector elements.

## 4,314,462
## METHOD AND APPARATUS FOR GUIDING A FLEXIBLE TUBE BETWEEN ANNULAR AND FLATTENED CROSS SECTION

Jean-Paul Ducol, Les Sauvages; Jacques Mesny, Troyes, and Julien Warret, Saint-Andre-les-Vergers, all of France, assignors to Institut Textile de France and Agence Nationale de Valorisation de la Recherche (ANVAR), both of, France

Filed Jan. 25, 1979, Ser. No. 6,518
Claims priority, application France, Feb. 2, 1978, 78 02944; Sep. 19, 1978, 78 26847
Int. Cl.³ D04B *15/88*
U.S. Cl. 66—152 19 Claims

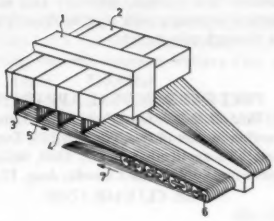



1. Method of guiding a tube having a flexible wall and extending between a first transverse plane in which the cross-section of the tube is annular and a second transverse plane in which the cross-section of the tube is linear, comprising the step of guiding a portion of the tube extending between the second plane and a third transverse plane situated between said first and second planes over a guiding means including a first section disposed in said third plane, said first section having a first set of four apices which are arranged within said tube so as to form a rectangular configuration, so that said portion is formed into a surface having side faces extending between a straight edge of said portion coinciding substantially with said linear cross-section of the tube in the second plane and a circumferential base of said portion which is situated opposite said edge and which extends in said third plane parallel to said edge, said base having a perimeter of a dimension substantially double that of the length of said edge, and said side faces being shaped so as to form a rectangle in any cross-sectional plane parallel to said second and third planes, said rectangle formed in any said cross-sectional plane parallel to said second and third planes having a perimeter equal to the perimeter of said circumferential base.

## 4,314,463
## JACQUARD ATTACHMENT FOR WARP KNITTING MACHINES

Rudolf Fuchs, Hofen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 14, 1980, Ser. No. 149,680
Claims priority, application Switzerland, May 18, 1979, 4645/79
Int. Cl.³ D04B *23/00, 27/00*
U.S. Cl. 66—203 6 Claims




1. A jacquard attachment for a warp knitting machine, said attachment comprising

at least one jacquard box having a plurality of movably mounted control elements and a plurality of harness cords, each said harness cord being connected to a respective control element;

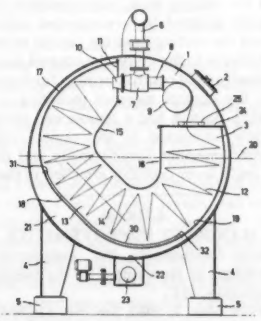
a plurality of deflecting means, each said deflecting means being disposed in spaced relation to said jacquard box for deflecting each said harness cord from a first path extending from a respective control element to said deflecting means into a second path extending from said deflecting means obliquely to said first path, said paths being disposed in overlying spaced relation to each other; and

a plurality of universal bearings, each said bearing having a respective deflecting means journalled thereon.

## 4,314,464
## WET TREATMENT OF TEXTILES

Staffan O. Gran, Baldersplatsen 7, Boras-Schweden, Sweden

Filed Apr. 11, 1979, Ser. No. 29,672
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1978, 2816808
Int. Cl.³ D06B *3/28*
U.S. Cl. 68—178 10 Claims



1. A device for the wet treatment of textiles in endless strip or web form, comprising a closed pressure housing having an interior wall for containing treatment liquid; an outlet located at the lowest point on said housing and opening through said housing interior wall; an inlet located at an elevated position on said housing and opening through said housing interior wall;

means for externally circulating treatment liquid, connected between said outlet and said inlet; a supply chamber in said housing, said supply chamber having an outer wall spaced from said housing interior wall and having a first portion thereof perforated and a second portion thereof unperforated and rectilinear and a third portion thereof perforated, said second portion being intermediate said first and third portions and being positioned proximate said outlet, said second portion having a rectilinear axis inclined at from 30° to 60° to the horizontal; and means for circulating textiles through said supply chamber and for feeding treatment liquid into said supply chamber first portion, whereby said supply chamber second portion separates said textiles from treatment liquid circulation through said outlet.

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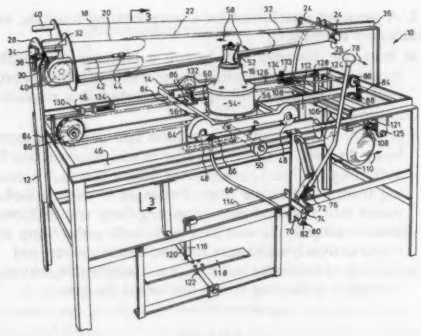
**4,314,465**

## PELT FAT REMOVAL APPARATUS

**Melville R. Reid, R.R. #6, Guelph, Ontario, Canada (N1H 6J3)**

**Continuation-in-part of Ser. No. 968,185, Dec. 11, 1978, abandoned. This application Jan. 3, 1980, Ser. No. 109,368**
**Claims priority, application Canada, Aug. 17, 1979, 334043**
**Int. Cl.³ C14B** *17/00*
**U.S. Cl. 69—40** **15 Claims**



1. In a machine for removing fat from the inside of an animal pelt, the machine have a rotatable elongate mandril for mounting the pelt inside out thereon, a motor driven pelt engaging cutting head mounted on a dolly on the machine frame for longitudinal movement adjacent to the mandril, and the cutting head being pivotally mounted on the dolly for transverse adjustment of the depth of cut, apparatus for controlling the movement of the cutting head, said apparatus comprising: a control assembly adapted to be connected between the machine frame and the cutting head for pivotal movement of the cutting head relative to the dolly; the control assembly including a longitudinally rigid control member for connection to the cutting head, the control member including a transversely flexible extension portion and a remote end portion; a toggle joint operatively connected to said remote end portion to move the control member longitudinally and thus pivot the cutting head; and a lever operably attached to the toggle joint.

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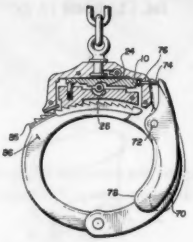
**4,314,466**

## HANDCUFF IMPROVEMENTS

**James E. Harris, Gaithersburg, Md., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.**

**Filed Mar. 3, 1980, Ser. No. 126,591**
**Int. Cl.³ E05B** *75/00*
**U.S. Cl. 70—16** **17 Claims**

1. A handcuff which may be triple locked, comprising a pair of pivotable arcuate locking arms which are attached to each other at one end of each arm at a pivot means, one of said arms having a lock including a pawl disposed at the other end of the arm and the other of said arms having ratchet teeth disposed at the other end of the arm for insertion into the lock for engagement with said pawl, said pawl being disposed on part of one side of a latch member, a bolt having a shoulder being disposed in said lock adjacent said latch member and being slidable between an undouble locked position in which said shoulder does not contact said latch member and a double locked position in which said shoulder overlies said latch member and thereby prevents pawl motion, said latch member and said bolt each having shaped portions including respective ledges and



said lock having a keyhole through which a key may be passed and caused to engage said ledges during motion for unlocking said bolt and said latch member, and said lock further having an abutment in the interior thereof and a biasing means for forcing said bolt against said abutment when said bolt is in said double locked position to automatically triple lock said lock, and means for moving said bolt away from said abutment against the force of said biasing means for untriple locking said lock, whereupon said key may be used to undouble lock and unlock said lock.

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**4,314,467**

## KEY RING WITH POSITIVE LOCKING MEMBER

**John Arvan, 137 Irving Ave., Port Chester, N.Y. 10573**

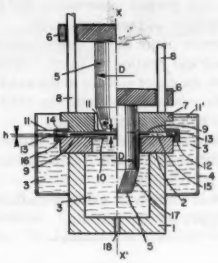
**Filed May 8, 1980, Ser. No. 147,927**
**Int. Cl.³ A47G** *29/10*
**U.S. Cl. 70—456 R** **7 Claims**

1. A positive locking key ring comprising:
(a) a rigid key loop having an opening therein to define loop ends whereby keys or other items having an opening therethrough can be threaded onto the loop;
(b) a front housing member;
(c) a back housing member, said back housing member formed with opposed slots disposed to receive the end of said loop;
(d) interengaging means on said housing members operable to releasably connect said front housing portion to said back housing portion with said portions defining a cavity therebetween; and
(e) a retaining member sized to substantially fill said cavity and having a pair or aligned grooves formed in a face thereof, said grooves being alignable with said slots and sized to receive the ends of said loop to securely hold the key loop in the housing when the housing portions are connected together.

## 4,314,468
## STAMPING IN LIQUID FEMALE TOOL

**Jacques Baril, L'Etang la Ville, and Jean-Yves Gaborieau, Velizy, both of France, assignors to Societe de Vente de l' Aluminium Pechiney, Paris, France**

**Filed Nov. 29, 1979, Ser. No. 98,559**
**Claims priority, application France, Dec. 11, 1978, 78 35301**
**Int. Cl.³ B21D *39/08***
**U.S. Cl. 72—57** **5 Claims**

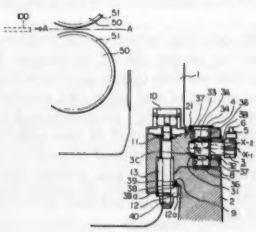


1. In a hydro-mechanical stamping method wherein a liquid-filled pressure chamber is bounded at the top by a stamping ring having an aperture with a section corresponding to the largest section of a punch mounted above the chamber for descent into the chamber to pressurize the liquid therein and to deform a blank, the improvement comprising the steps of:
(a) maintaining the level of the liquid within the chamber constantly above the stamping ring and above the upper plane of the blank, the blank thereby being submerged within the liquid even prior to initiation of stamping, and
(b) centering the blank relative to the stamping ring within the liquid and providing circuitous paths between the blank, the stamping ring and structure used to center the blank in order to prevent localized rupture of the blank.

## 4,314,469
## ROLLING MILL

**Takashi Kitamura; Yoshiro Sumi, and Akira Matsufuji, all of Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan**

**Filed Apr. 30, 1980, Ser. No. 145,386**
**Claims priority, application Japan, May 4, 1979, 54/54071**
**Int. Cl.³ B21B *1/14, 31/06, 31/18***
**U.S. Cl. 72—221** **4 Claims**

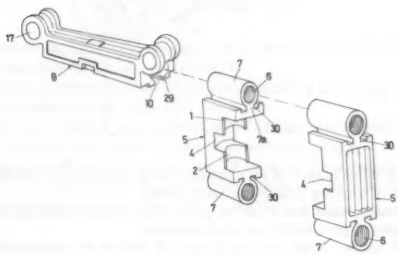


1. A rolling mill comprising a roll stand which supports rolls provided with roll passes for rolling a blank to be rolled which reciprocally moves along a rolling line, said roll stand being supported on a stationary base so as to move in axial directions of the rolls perpendicular to the rolling line, wherein said mill comprises a drive connected to the roll stand for moving the roll stand in said axial directions, and rotatable wheels which are provided in the roll stand and which are selectively brought into contact with the stationary base so as to carry the roll stand on the stationary base; said mill further comprising rotatable eccentric rods which are provided in the roll stand and which support thereon the rotatable wheels, said eccentric rods being rotated to selectively occupy a non-operational position in which the wheels are separated from the stationary base, and an operational position in which the wheels are brought into contact with the stationary base and the roll stand is separated from the stationary base, so that the wheels can rotate on the stationary base to move the roll stand in said axial directions.

## 4,314,470
## ROLLER DIE WIRE DRAWING DEVICE HAVING A PLURALITY OF ROLLER DIE UNITS

**Keiichiro Yoshida, No. 641, Mobara, Mobara City, Chiba Prefecture, 297, Japan**

**Filed Oct. 22, 1979, Ser. No. 87,303**
**Claims priority, application Japan, Mar. 15, 1979, 54-30198**
**Int. Cl.³ B21B *31/00***
**U.S. Cl. 72—234** **10 Claims**



1. A wire drawing device comprising:
at least two roller die units, each of said roller die units having:
two rollers, each of said rollers having a radially inwardly extending groove around the circumferential edge thereof;
two bearing frames, each of said frames having two threaded holes respectively through opposite ends thereof, said holes in one of said bearing frames being treaded in a direction which is opposite the direction of the threads of said holes in the other of said bearing frames;
each of said rollers being respectively rotatably accommodated in one of said bearing frames;
at least two externally threaded shanks for being threadably received in said holes;
said bearing frames being dimensioned and positioned such that the axes of rotation of said rollers are parallel to one another, said inwardly extending groove of each of said rollers are oppositely aligned with one another thereby defining an aperture for allowing a wire stock to be drawn therethrough, said holes in one of said bearing frames are respectively aligned with said holes in the other of said bearing frames, and said shanks are respectively threadably extended therethrough whereby said bearing frames are attached to and are oppositely aligned with one another; and
said shanks being rotatable in one direction to move said rollers toward one another and rotatable in the other direction to move said rollers away from one another;
at least two housing frame means, wherein each of said housing frame means contains said two bearing frames;
attaching means for attaching said housing frame means side-to-side; and
wherein said housing frame means are dimensioned and positioned so that, when they are attached, the axes of

rotation of said rollers contained in adjacent said housing frame means are other than parallel.

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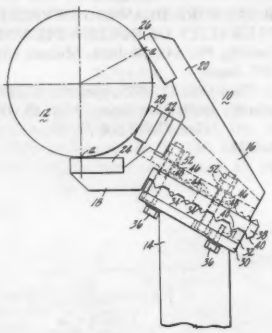
**4,314,471**

## METAL EXTRUSION PRESS-BILLET LOADER

**Danil Lukach, Rochester, N.Y., assignor to USM Corporation, Farmington, Conn.**

**Filed Feb. 11, 1980, Ser. No. 120,537**
**Int. Cl.³ B21C *33/00***
**U.S. Cl. 72—270** **7 Claims**



1. A billet loader of an extrusion press machine for loading billets of varying diameters, comprising:

a loader head mounted on a movable arm to pick-up and discharge a billet into said machine;

said loader head having adjustable means to supportably accommodate seriatum a plurality of billet diameters therewith; and

said adjustable means comprising at least three supports adjustably arranged with respect to said movable arm, at least one of said supports being movable with respect to the remaining pair of supports through a grooved relationship therebetween, permitting selectable aligned preadjusted stepwise carrying capacity to said loader head.

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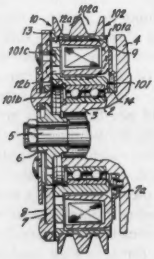
**4,314,472**

## METHOD FOR PRODUCING A MAGNETIC ROTATABLE MEMBER FOR AN ELECTROMAGNETIC CLUTCH

**Nobuaki Saegusa; Masakatsu Sakaki, and Genzo Yanai, all of Isesaki, Japan, assignors to Sankyo Electric Company Limited and Yanai Seiko Company Limited, both of Isesaki, Japan**

**Filed Dec. 18, 1979, Ser. No. 104,768**
**Claims priority, application Japan, Dec. 21, 1978, 53/158975**
**Int. Cl.³ B21D *28/00***
**U.S. Cl. 72—341** **3 Claims**



1. A method for producing a magnetic rotatable member for an electromagnetic clutch having a cross section of a generally U-shaped form to define an annular hollow portion in which an electromagnetic coil should be disposed and having a stopper for a bearing means on which the rotatable member should be mounted, which comprises steps of:

preparing a magnetic circular plate of a predetermined dimension;

forming an annular blank from said circular plate by press-drawing process which has an outer annular cylindrical portion, an inner annular cylindrical portion, and an axial end annular plate portion connecting said outer and inner cylindrical portions at their axial ends;

ironing said annular blank at the outer surface of said outer annular cylindrical portion to form a radially projecting annular rim on the outer surface at the axial end so that the axial end surface is arranged with the axial end surface of said axial end annular plate portion;

cutting away an outer edge portion of said inner annular cylindrical portion at the other axial end to form an annular thin wall portion; and

press-bending said thin wall portion radially inwardly to form said stopper for the bearing.

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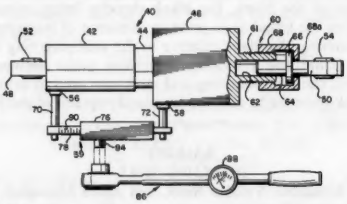
**4,314,473**

## METHOD AND APPARATUS FOR TESTING SNUBBERS IN SITU

**Harry E. Sulzer, Telford, Pa., assignor to Anchor/Darling Industries, Inc., Bala Cynwyd, Pa.**

**Filed Oct. 15, 1979, Ser. No. 84,985**
**Int. Cl.³ G01M *19/00***
**U.S. Cl. 73—11** **13 Claims**



1. In a method of testing a snubber in situ in a snubber system including a supporting structure, a structure supported by said supporting structure, and a snubber having relatively movable sections and being operatively coupled between said supporting structure and said supported structure; the steps comprising:

(a) loosening the coupling between said snubber and one of said structures to permit limited movement between the relatively movable sections of said snubber without inducing substantial movement of said supported structure;

(b) applying a test force within a predetermined high range to the snubber system for a period of time sufficient to cause relative motion of a predetermined magnitude between said relatively movable sections of said snubber; and

(c) comparing said period of time with a time standard established for said snubber.

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**4,314,474**

## CRACK DETECTION BY VAPOR CONDENSATION

**Aaron Dermarderosian, Marlboro, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jan. 29, 1980, Ser. No. 116,516**
**Int. Cl.³ G01N *25/72, 31/02, 21/88***
**U.S. Cl. 73—15 FD** **9 Claims**

1. A method indicating the existence of cracks, fissures and other such faults on a test surface comprising the steps of:

forming an indicating layer over the entire test surface by directing an inert fluorocarbon vapor into contact with the test surface, the relative temperatures of the inert vapor and the test surface being such that the indicating layer forms by the process of condensation; and

visually examining said indicating layer at an angle to a light source, the existence of any cracks, fissures and other such faults being indicated in a dull outline conforming to the shape of the fault as a result of the differential reflection of the incident light off of the said indicating layer, faulted regions absorbing comparatively more of said incident light than unfaulted regions.

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## 4,314,475
## METHOD FOR CHECKING THERMOCATALYTIC SENSORS OF MINE SAFETY SYSTEMS

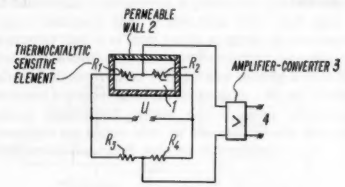
**Evgeny F. Karpov, prospekt Vernadskogo, 125, kv. 167; Isaak E. Birenberg, Leningradsky prospekt, 9, kv. 25; Boris I. Basovsky, ulitsa 16 Parkovaya, 49, korpus 1, kv. 58, all of, Moscow, and Vladimir V. Popov, Moskovskoi oblasti poselok VUGI, 6, kv. 18, Ljubertsy-4 Moskovskoi oblasti, all of U.S.S.R.**

**Continuation of Ser. No. 945,919, Sep. 26, 1978, abandoned. This application Jan. 14, 1980, Ser. No. 112,139**

**Claims priority, application U.S.S.R., Mar. 2, 1978, 2587202**

**Int. Cl.³ G01N *25/32***

**U.S. Cl. 73—27 R** **1 Claim**




1. A method for checking, in a mine environment, a thermocatalytic methane sensor having a gas permeable reaction chamber housing a thermo-catalytic converting element and a supply voltage for controlling the temperature of said thermo-catalytic converting element, comprising the successive steps of:

reducing the sensor supply voltage to a level at which said thermo-catalytic converting element is cooled to a temperature obviating methane oxidation thereon;

keeping the sensor at the reduced supply voltage for a time at least equal to a period during which methane concentration in said reaction chamber is levelled out to become equal to that in the mine environment;

raising the sensor supply voltage, following the levelling out of methane concentration, stepwise to a level at which said thermo-catalytic converting element is heated to a temperature at which methane is oxidized thereon;

measuring maximum and steady-state output signals provided by the sensor and also the time constant of a transient process during which the methane concentration changes within said reaction chamber and which continues until a dynamic equilibrium is set up between methane oxidizing on said thermo-catalytic converting element and methane penetrating into said reaction chamber from the mine environment;

determining, after said measurements, efficiency of the thermo-catalytic converting element in methane oxidation, resistance of at least a wall of the reaction chamber to diffusive transfer of methane through its walls, and the sensor error in measuring methane concentration on the basis of the following expressions:

$$\gamma = \frac{S_H - S_y}{TS_H} V_K$$

where $\gamma$ is the throughput rate of the thermo-catalytic converting element in $m^3$/sec;

$S_H$ and $S_y$ are the maximum and steady-state values of the output signals of said sensor;

$V_K$ is the volume of the reaction chamber, in cu.m.;

T is the time constant of the transient process, in seconds;

$$\phi = \frac{S_H T}{S_y V_K}$$

where $\phi$ is the resistance of said wall of the reaction chamber to the transfer of methane through its gas-permeable walls, in sec/$m^3$;

$$\Delta C = C - \frac{100 T S_H^2}{KV_K(S_H - S_y)}$$

wherein $\Delta C$ is the absolute error in methane concentration measured by the sensor, in vol.%;

C is the methane concentration corresponding to the signal $S_H$ produced by the sensor, in vol.%;

100 is a coefficient for converting the volume concentration of methane from relative units to percentage points;

K is a coefficient of conversion of methane flow reacting on said thermo-catalytic converting element to an electric signal being measured, [Bc/$m^3$ or Ac/$m^3$].

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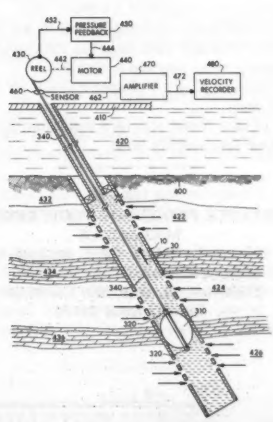
## 4,314,476
## WELL FLUID VELOCITY MEASUREMENT METHOD AND SYSTEM

**Irvin D. Johnson, Englewood, Colo., assignor to Marathon Oil Company, Findlay, Ohio**

**Filed May 27, 1980, Ser. No. 153,505**

**Int. Cl.³ E21B *47/00***

**U.S. Cl. 73—155** **9 Claims**




1. An improved method of measuring the velocities of fluids flowing in a well bore hole, wherein the improvement comprises the steps of:

inserting an unexpanded restrictor (310) carrying a differential environmental condition sensor (320) into the bore hole (10) to a desired depth;

expanding the restrictor (310) in the bore hole (10) at said

desired depth, said expanded restrictor (310) being capable of substantially minimizing any stirring occurring in said fluids and impeding the flow of said fluids;

sensing a differential environmental condition on opposing ends of the restrictor (310) with said sensor (320);

pulling (430, 440 and 450) the restrictor (310) at a sufficient velocity upwardly in the bore hole (10) to maintain the sensed differential environmental condition at substantially zero; and

measuring (460, 470, and 480) the velocity at which the restrictor (310) is pulled, said measured velocity being substantially equal to the velocity of fluids in the well in the vicinity of said restrictor (310).

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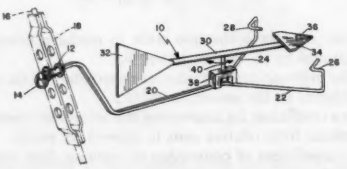
4,314,477

## SAILBOAT WIND DIRECTION INDICATOR

Mark E. Yancy, 4004 La Salle St., San Diego, Calif. 92110

Filed Jan. 11, 1980, Ser. No. 111,212
Int. Cl.[3] G01P *13/02*; G01W *1/00*
U.S. Cl. 73—188 4 Claims



1. A sailboat optimum heading indicator comprising:

support means for mounting forward of the foremost sail on a sailboat, said support means including a generally Y-shaped frame having a pair of forwardly extending arms and an elongated backward extending body having means defining a journal extending generally horizontally outward at the end thereof for rotatably mounting in a mounting bracket,

a vertical pivot bracket at the juncture of the arms with said body,

wind direction responsive means mounted on said pivot bracket for pivoting about a vertical axis,

the arms of said frame defining indicia means positioned for alignment with said wind direction indicating means when an optimum wind heading is obtained,

wherein the mass of said Y-shaped frame is off set below said journal, and,

the mass of said frame acts as a pendulum for maintaining said frame substantially level.

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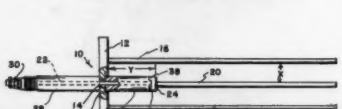
4,314,478

## CAPACITANCE PROBE FOR HIGH RESISTANCE MATERIALS

Norman V. Beaman, La Habra, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 16, 1979, Ser. No. 94,869
Int. Cl.[3] G01F *23/26*
U.S. Cl. 73—304 C 6 Claims




1. A capacitance probe for location in a vessel in the path of falling, substantially electrically non-conductive particulate matter to detect collection of such particulate matter to a predetermined level in the vessel, said probe comprising:

an electrically conductive mounting member;

at least one elongated, flat sided capacitor blade, said blade being electrically grounded and cantilever mounted at one end to said member;

an elongated, flat sided capacitor sensor element arranged in parallel, confronting, spaced apart relation to said blade;

means cantilever mounting one end of said sensor element in electrically insulative relationship to said member; and

mounting means operative to mount said member to said vessel and horizontally project said blade and said sensor element within said vessel at a predetermined level, with the flat sides thereof vertically oriented whereby said particulate matter can fall freely past said blade and said sensor element without collecting therebetween.

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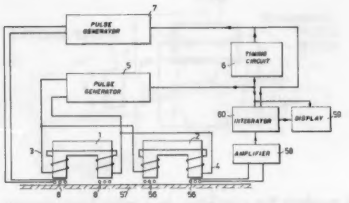
4,314,479

## METHOD AND APPARATUS FOR TRANSMITTING AND RECEIVING ELECTROMAGNETICALLY GENERATED AND RECEIVED ULTRASONIC PULSES

Johan Spijkerman, Nyköping, Sweden, assignor to Studsvik Energiteknik AB, Nyköping, Sweden

Filed Oct. 31, 1979, Ser. No. 89,983
Claims priority, application Sweden, Nov. 7, 1978, 7811513
Int. Cl.[3] G01N *29/04*
U.S. Cl. 73—643 12 Claims

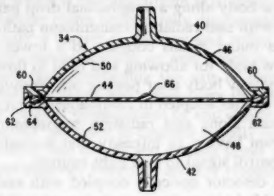



1. A method of transmitting and receiving electromagnetically generated and received ultrasonic pulses, especially for non-destructive testing of electrically conductive material, particularly steel with a temperature above the Curie-temperature, comprising the steps of generating one or more magnetic fields by one or more electromagnets (1, 2, 3, 4) where said magnetic field is generated in the form of time-spaced pulses by a first pulse generator (5) and where each magnetic field pulse has a duration that is short as compared with the time interval between two successively occurring magnetic field pulses, characterized in that when the magnetic field or fields increase to at least a pre-selected strength, preferably 50 percent of maximum strength, a series of time-spaced electrical pulses of supersonic frequency are generated by a second pulse generator (7) and are supplied to a transmitter coil (8) within one of the magnetic fields to produce a corresponding number of ultrasonic pulses of well-defined length in said material, that a signal resulting from each ultrasonic pulse is received by a receiver coil (56) within one of said magnetic fields, that the receiver coil is scanned after each electrical pulse for sensing a received signal corresponding to each electrical pulse, that each such received signal is stored in an integrator (60) such that the series of received signals corresponding to said series of electrical pulses is summed up, whereafter the signal summed up in the integrator is emitted to a signal utilization unit (59), and that the last electrical pulse in said series is generated when said magnetic field or fields has decreased to a pre-selected strength, preferably 50 percent of maximum strength.

## 4,314,480
## VENOUS PRESSURE ISOLATOR

**Lawrence F. Becker, Chicago, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Filed Jul. 14, 1980, Ser. No. 168,471**
**Int. Cl.³ G01L *7/08***
**U.S. Cl. 73—706** **10 Claims**



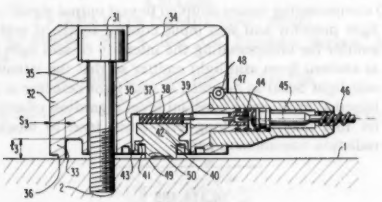

1. Apparatus for isolating a pressure-sensitive device from blood flowing in an extracorporeal blood system and for transmitting the blood pressure from a blood flow line coupled to the pressure sensing device through the isolating apparatus, including a pressure chamber having an inlet coupled to the blood flow line and an outlet coupled to the pressure sensing device, and a membrane disposed transverse said chamber and surrounded by the chamber to segregate an inlet side of said chamber from an outlet side of said chamber, said membrane being fluid-impermeable and having its outer peripheral portion connected to the surrounding housing, comprising:

said membrane comprising a generally planar member having a thickness that is less than 0.04 inch and having a diameter that is at least twice as great as the intended total deflection distance; the membrane having a Young's modulus of no more than 300 psi and having a modulus at 300 percent elongation of no more than 750 psi; the membrane being positioned within the housing whereby greater pressure on either side of the membrane will cause it to deflect to the other side by stretching.

## 4,314,481
## PIEZOELECTRIC STRAIN TRANSDUCER

**Peter Wolfer, Kleinandelfingen; Hans-Rudolf Derrer, Rheinau; Max Vollenweider, Winterthur, and Hans-Conrad Sonderegger, Neftenbach, all of Switzerland, assignors to Kistler Instruments AG, Winterhur, Switzerland**

**Filed Dec. 20, 1979, Ser. No. 105,703**
**Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2855746**
**Int. Cl.³ G01B *7/16*; G01L *1/16***
**U.S. Cl. 73—774** **17 Claims**

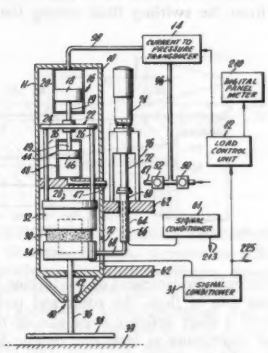



1. Piezoelectric strain transducer for determining the elongation of a measuring section on the surface of a test specimen under cyclic compressive or tensile load, the transducer comprising two spaced bearing surfaces for frictionally engaging the measuring surface section of the test specimen, at least one of the bearing surfaces being connected to at least one adjustable resilient member and at least the other bearing surface being connected to a support member of the transducer forming a support surface for at least one piezoelectric plate means, the piezoelectric plate means being under pre-compression and arranged for responding solely to shearing forces, a force-transmitting member of the transducer extending from the resilient member to the piezoelectric plate means for bearing upon the upper surface of the piezoelectric plate means, a single screw extending through the transducer between the bearing surfaces for frictionally connecting the transducer to the measuring section, whereby upon a change in length of the measuring section, substantially only a shearing force acts on the piezoelectric plate means corresponding to the strain in the measuring surface section and resulting in the emission of corresponding electric signals from the transducer.

## 4,314,482
## ANALOG-DIGITAL CONTROL DEVICE

**Theodore J. Krainski, Jr., Old Bridge, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.**

**Filed May 12, 1980, Ser. No. 149,216**
**Int. Cl.³ G01N *3/00***
**U.S. Cl. 73—805** **18 Claims**




1. A control apparatus comprising:

multi-channel analog memory means for storing input analog information and having multiple, readily accessible, manually selectable access ports;

multi-channel digital memory means for storing input digital information and having multiple, readily accessible, manually selectable access ports;

multiplexer means adapted to receive input analog information from said multi-channel analog means and input digital information from said multi-channel digital means and to generate a signal representative of said input analog information in accordance with said input digital information;

switching means for switching said multiplexer means from one channel of input to the next in prescribed sequence; and,

operational amplifier means for receiving a first signal from said multiplexer means and for receiving a second signal from an external feedback element, and for generating an outlet signal representative of said analog information compensated by said feedback signal to an external component.

## 4,314,483
## MASS RATE OF FLOW METER WITH IMPROVED TEMPERATURE CHARACTERISTICS

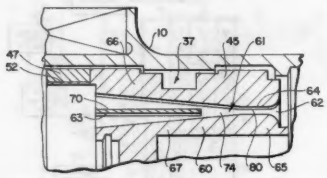
**John S. Wyler, Andover, Mass., assignor to General Electric Company, Wilmington, Mass.**

**Filed Oct. 12, 1979, Ser. No. 84,505**
**Int. Cl.³ G01F *1/80***
**U.S. Cl. 73—861.35** **13 Claims**

1. In a mass rate of flow meter of the angular momentum type having a housing, a swirl generator for imparting angular

momentum to the measured fluid stream, a rotor downstream from the swirl generator, the rotor being rotated by the fluid from the swirl generator, and a restrained reaction turbine downstream from the rotor that removes angular momentum from the swirling fluid exiting the rotor, the rotor and turbine each being journaled on a shaft and including an inner hub and outer annulus, the improvement comprising at least one tapered, flow-conveying passage in the rotor having a substantially converging inlet section for imparting a uniform flow velocity to incoming fluid from the swirl generator and a substantially diverging outlet section downstream from said converging inlet sections for decreasing the uniform velocity by expanding the outgoing fluid stream.

6. A mass rate of flow meter of the angular momentum type having a housing, a rotating assembly mounted with and spaced from the housing, a swirl generator for imparting angular momentum to the measured fluid stream, said rotating assembly including a rotor element downstream from the swirl generator which is rotated by the fluid from the swirl generator, and a restrained, partially rotatable, reaction turbine element downstream from the rotor that removes angular momentum from the swirling fluid exiting the rotor with the




partial rotational displacement of the turbine being a measure of the mass rate of flow, the rotor and turbine each being journaled on a shaft defining their axis of rotation, the improvement comprising at least one double labyrinth sealing means formed between the housing and one of said rotor or turbine elements for impeding the flow of fluid there between, said housing and said rotating element having cooperating projections and surfaces to define;

(a) a first pair of interconnected, longitudinal, radially offset passages between the housing and one of said elements;

(b) a second pair of interconnected; longitudinal, radially offset passages, between said housing and said rotating element and axially displaced from said first pair, one of said longitudinal passages in said second pair being at the same radial distance from the axis of rotation as one of the longitudinal passages in said first pair the passages at the same radial distance being axially interrupted, and the remaining longitudinal passages in each pair being at different radial distances from the axis of rotation whereby the horizontal passages in the double labyrinth seal are located at least at three different radial distances from the axis of rotation to facilitate axial removal and insertion of the rotating assembly.

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**4,314,484**

## SELF-COMPENSATING OPTICAL DROP COUNT APPARATUS FOR MEASURING VOLUMETRIC FLUID FLOW

**Robert J. Bowman, Salt Lake City, Utah, assignor to University of Utah Research Foundation, Salt Lake City, Utah**

**Filed Oct. 9, 1979, Ser. No. 83,002**

**Int. Cl.³ G01F *13/00*; A61M *5/00***

**U.S. Cl. 73—861.41** **19 Claims**

1. A self-compensating optical drop count apparatus for measuring volumetric fluid flow comprising:

(a) a drop chamber including:

(1) a hollow body, having a radiation transmission path therethrough,

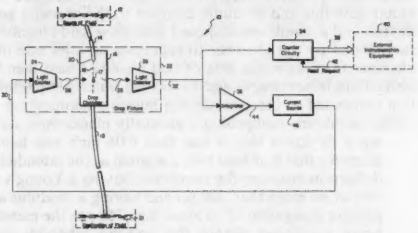
(2) fluid inlet means coupled to an upper end of said hollow body for allowing a fluid to flow into said hollow body,

(3) drop formation means coupled to said fluid inlet means for causing said fluid to break up into drops of an approximate uniform volume before said fluid passes through said hollow body, said drop formation means being positioned so that said drops pass through said hollow body along a longitudinal drop path that intersects with said radiation transmission path, and

(4) fluid outlet means coupled to a lower end of said hollow body for allowing said fluid to flow away from said hollow body after passing therethrough;

(b) a light emitter adapted to continuously emit a directional light beam along said radiation transmission path, said light beam having an intensity that is controlled by an input control signal to said light emitter;

(c) a light detector optically coupled with said light beam after said light beam has passed through said hollow body along said radiation transmission path, said light detector being adapted to generate an output signal that indicates the presence and intensity of said light beam at said light detector;



(d) counting means coupled to said output signal of said light detector for counting interruptions that occur in said output signal, said interruptions being caused by said drops of fluid as said drops pass through said hollow body and interrupt said light beam, said counting means including single count protection means for counting only one interruption of a plurality of interruptions occurring in said output signal as a result of one of said drops breaking up into a plurality of smaller drops as it passes through said hollow body, said counting means thus adapted to count the number of drops of said liquid that pass through said chamber, said count, in combination with the approximate known volume of said drops, thus providing a measure of the volumetric flow of said fluid; and

(e) compensating means coupled to said output signal of said light detector and said input control signal of said light emitter for compensating the intensity of said light beam as emitted from said light emitter so that the intensity of said light beam as detected at said light detector is maintained at an average constant level regardless of any matter that may, on a long-term basis, tend to block said radiation transmission path.

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**4,314,485**

## SPEED CONTROL SYSTEMS

**Frederick J. Adams, Clevedon, England, assignor to Cam Gears Limited, Hertfordshire, England**

**Filed Nov. 14, 1979, Ser. No. 94,225**

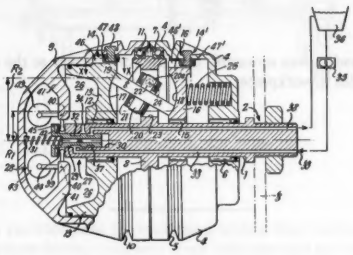
**Claims priority, application United Kingdom, Nov. 16, 1978, 44743/78**

**Int. Cl.³ F16H *15/38*, *17/06***

**U.S. Cl. 74—200** **15 Claims**

1. A speed control system comprising co-axially mounted driven and driving plates having opposed annular grooves co-axial with the plates, said opposed grooves forming a gener-

ally toroidal track, a power transmitting roller mounted and running within the track, said roller being rotatable about an axis which lies substantially in a plane containing the axis of rotation of said driven and driving plates and engaging within each of the opposed grooves so that on rotation of said driving plate in one direction power is transmitted therefrom through the roller to rotate said driven plate in the opposite direction, a system part which is restrained from axial displacement, said driven and driving plates being axially displaceable relative to said system part, a carrier supporting said roller, said carrier being pivotally mounted about an axis which is substantially normal to said plane containing the axis of rotation of said driven and driving plates and offset from the center of said roller so that on axial displacement of said driven and driving plates said carrier can pivot to displace radially relative to the axis of rotation of said driven and driving plates the positions of engagement between the roller and the respective grooves



to effect a change in ratio of angular velocity at which said driving plate is driven relative to said driven plate, means biasing said driven and driving plates toward each other and into engagement with said roller, one of said driven and driving plates being biased towards the other plate and into engagement with said roller by fluid under pressure in an expansible chamber associated with said one of said driving and driven plates, valve means for controlling the admission of fluid to and the exhausting of fluid from said expansible chamber, said valve means being responsive to the speed of rotation of either said driven or driving plate so that said valve means is controlled in accordance with variations in rotational speed of either said driven or driving plate to which it is responsive to cause an adjustment in fluid pressure in the expansible chamber and thereby displacement of said one of said driven and driving plates and a variation in the ratio at which drive is transmitted through the system between said driven and driving plates.

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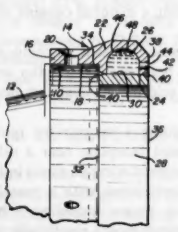
**4,314,486**

## VIBRATION DAMPENING RING

**Lowell L. Hellwig, Rte. 4, Box 326, Excelsior Springs, Mo. 64024**

**Filed Apr. 11, 1980, Ser. No. 139,736**
**Int. Cl.³ F16F *15/16***
**U.S. Cl. 74—574** **8 Claims**



1. A vibration dampening ring for mounting concentrically on an outer peripheral portion of a high speed rotating component, said ring including an annular mounting flange portion and an annular main body portion formed integrally with and spaced axially relative to said mounting flange portion, said mounting flange portion including means adapted for rigid mounting on and support from said outer peripheral portion, said main body portion including a cylindrical seating surface and having an elongated groove formed in and extending peripherally thereabout, said groove opening laterally outwardly through said cylindrical seat surface intermediate the opposite axial ends thereof, and a closure ring defining a cylindrical closure surface supported from said body portion with said closure surface abutting and sealingly secured to said seating surface on opposite sides of said groove closing the latter, said closed groove having movement dampening liquid disposed therein and fluent weight material of a greater specific gravity than said liquid also disposed in said groove.

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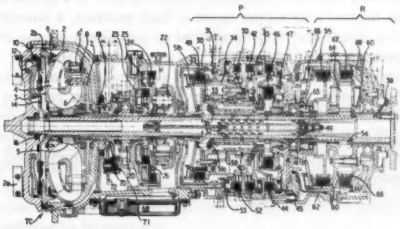
**4,314,487**

## BRAKING METHOD FOR VEHICLE TRANSMISSION

**Karl G. Ahlen, Bromma, Sweden, assignor to S.R.M. Hydromekanik Aktiebolag, Stockholm-Vallingby, Sweden**

**Filed Jan. 15, 1979, Ser. No. 3,526**
**Claims priority, application United Kingdom, Aug. 18, 1978, 3309/78; Aug. 24, 1978, 34391/78; Nov. 6, 1978, 43313/78; Nov. 6, 1978, 43315/78; Nov. 21, 1978, 45431/78; Nov. 21, 1978, 45432/78**
**Int. Cl.³ F16H *47/00*; B60K *41/12***
**U.S. Cl. 74—865** **18 Claims**



1. A method for braking a vehicle with an engine operatively connected to a transmission which comprises a torque converter having a pump member, a guide member and a turbine member, and a multi-step mechanical gear transmission in series with the torque converter, the multi-step transmission being downstream from the torque converter with the turbine member being connected to the input of the said multi-step transmission, and the output of the multi-step transmission being operatively connected to the road wheels of the vehicle, said method comprising driving the turbine member at a higher speed than the pump member with the sole driving connection from the vehicle road wheels to the pump member being via the turbine member through the torque converter, and with the pump member connected to rotate at the same speed as the engine, and regulating the braking effort by controlling the speed of the engine.

**4,314,488**

## HYDRAULIC CONTROL VALVE SYSTEM WITH A PRESSURE REGULATOR FOR A PLANETARY GEAR TRANSMISSION

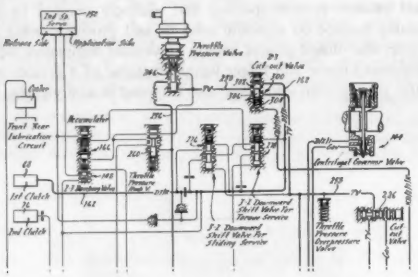
**Walter Lauven, Wohnpark, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Sep. 14, 1979, Ser. No. 75,456**

**Claims priority, application Fed. Rep. of Germany, Sep. 23, 1978, 2841526**

**Int. Cl.³ B60K *41/04, 41/06***

**U.S. Cl. 74—869** **3 Claims**



**1.** A hydraulic control valve system for an epicyclic change-speed gearbox for a motor vehicle comprising a planetary gear train having gear elements that are relatively movable, one with respect to the other, to establish speed ratios, clutches and brakes for controlling the relative motion of said gear elements, a high speed ratio clutch means for effecting a one to one driving condition through said gearbox, a reaction brake adapted to anchor a reaction gear element of said gearbox to establish an underdrive condition, clutch and brake servos for actuating said clutches and brakes, a pressure source comprising a pump driven by a power input element of said gearbox, a control valve circuit connecting said pump to said clutch and brake servos, a pressure regulator valve in said valve system including a pressure amplifier valve, a source of a torque signal that responds to torque input to said gearbox, a source of a speed signal that is proportional in magnitude to the driven speed of a driven member of said gearbox, said amplifier valve being subjected to said signals and a cut-out valve means in said valve system for interrupting communication between said amplifier valve and said torque signal source thereby preventing the transmission of said torque signal to the oil pressure amplifier valve as soon as an upshift into the high speed ratio condition occurs.

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**4,314,489**

## SCREWDRIVERS

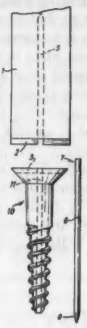
**Aldo Arcangeli, 132 Nelson Ave., Livingston, W. Lothian, Scotland**

**Filed Nov. 15, 1979, Ser. No. 94,741**

**Int. Cl.³ B25B *15/00***

**U.S. Cl. 81—451** **1 Claim**

**1.** In combination, a screwdriver, a screw and a pin, in which the screwdriver has a working end adapted to engage a head of the screw, the screwdriver and screw each having bore means for slidably receiving the pin whereby in use the working end of the screwdriver is held against lateral movement across the head of the screw and wherein the pin extends through the



screw and moves upwardly into the screwdriver as the screw penetrates a workpiece.

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**4,314,490**

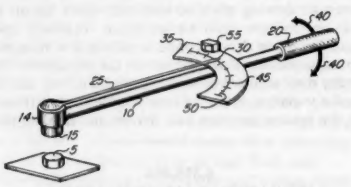
## TORQUE WRENCH WITH ALARM INDICATOR

**Gregory M. Stone, 11200 Powderhorn, Boise, Id. 83704**

**Filed Jun. 30, 1980, Ser. No. 164,778**

**Int. Cl.³ B25B *23/142***

**U.S. Cl. 81—479** **2 Claims**



**1.** A torque wrench comprising:

a mechanical arm having at one end a grip area adapted for the manual application of force to produce torque;

a faceplate affixed to said mechanical arm in the vicinity of said grip for displaying torque calibration marks, said faceplate including a material capable of magnetic attraction;

a pointer arm disposed on said mechanical arm to provide relative motion between said pointer arm and said faceplate affixed to said mechanical arm proportional to said torque; and

alarm means including a magnet for removable magnetic attachment to said faceplate near a selected calibration mark thereon for producing an alarm indication when said pointer arm is coincident with a preselected calibration mark, said alarm means including a battery, an alarm indicator and switch means electrically interconnected to activate said indicator upon contact of said switch means by said pointer.

## 4,314,491
## PORTABLE SPECIAL LATHE FOR FLANGES OF LARGE DIMENSIONS

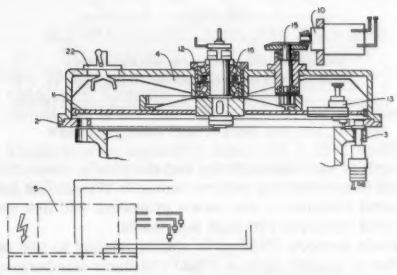
**Willi Hartmann, Hoyerswerda, and Klaus Huth, Hoyerswerda, both of German Democratic Rep., assignors to Veb Gaskombinat Schwarze Pumpe, Schwarze Pumpe, German Democratic Rep.**

**Filed Jun. 7, 1979, Ser. No. 46,497**

**Claims priority, application German Democratic Rep., Jun. 22, 1978, 206199**

**Int. Cl.³ B23B *5/00***

**U.S. Cl. 82—4 R** **9 Claims**



1. A portable lathe for machining sealing faces on flanges of work pieces having relatively large diameters and not removed from their location, comprising a machine unit and a hydraulic unit; said machine unit including a housing with a centering flange, a main drive, a rotatary turntable operatively connected to said drive, and a tool holder provided with a hydraulic motor; an intermediate flange positioned between the workpiece and said turntable and including a stepped-like flange surface coordinated with said centering flange, said intermediate flange being formed with a plurality of circumferentially distributed threaded holes; and a clamping system for connecting the workpiece to said intermediate flange, said clamping system including a plurality of bolts having external threads threaded into said threaded holes and each formed with a circumferential groove, a plurality of spacers each mounted in the respective groove of the respective bolt, and a plurality of hydraulic clamping cylinders connected to said bolts for adjustably coupling said intermediate flange to the workpiece.

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## 4,314,492
## APPARATUS FOR THE OUT-OF-ROUND MACHINING OF WORKPIECES

**Otto Feller, Krähwinkel 47 g, D-5653 Leichlingen 1; Manfred Kühl, Baumberger Strasse 17, D-5090 Leverkusen 1, and Heinz Oepen, Brunnenweg 6, D-5609 Hückeswagen, all of Fed. Rep. of Germany**

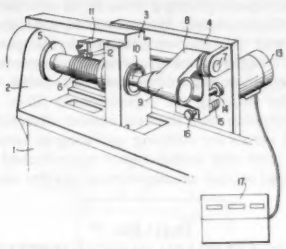
**Filed Feb. 14, 1980, Ser. No. 121,514**

**Claims priority, application Fed. Rep. of Germany, Mar. 3, 1979, 2908383**

**Int. Cl.³ B23B *3/28, 3/00***

**U.S. Cl. 82—18** **6 Claims**

1. In an apparatus for the out-of-round circumferential machining of workpieces, including a tool holder, a tool bit carried by the tool holder, a motor having a rotor operatively coupled to the tool holder for a radial feed of the tool bit; and means for numerically and electronically controlling the motor dependent upon a desired out-of-round contour of the workpieces, the improvement wherein the moment of inertia of the tool holder, the tool bit and any other component moving with



the tool holder as a unit during said feed motion is at the most equal to the moment of inertia of said rotor.

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## 4,314,493
## AUTOMATIC RHYTHM PATTERN ACCOMPANIMENT EQUIPMENT

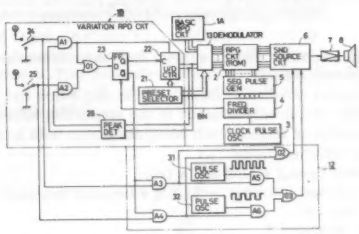
**Yoh-Ichi Kondo, Kokubunji, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Shizuoka, Japan**

**Continuation of Ser. No. 961,067, Nov. 15, 1978, abandoned. This application Mar. 24, 1980, Ser. No. 133,154**

**Claims priority, application Japan, Nov. 26, 1977, 52/141757; Nov. 29, 1977, 52/142951; Nov. 29, 1977, 52/142952**

**Int. Cl.³ G10F *1/00***

**U.S. Cl. 84—1.03** **11 Claims**




1. An automatic rhythm-pattern accompaniment equipment comprising:

an accompaniment rhythm-pattern generator for storing a plurality of accompaniment rhythm-patterns,

an accompaniment rhythm-pattern designation circuit for selecting a desired one of said accompaniment rhythm-patterns to be read out,

a sequence pulse generator providing an output to the accompaniment rhythm-pattern generator for the determination of signal read-out time of the accompaniment rhythm-pattern generator,

a sound source circuit supplied with the read-out signal from the accompaniment rhythm-pattern generator for producing a selected accompaniment rhythm sound, said sound source circuit producing a first accompaniment rhythm sound when a first accompaniment rhythm-pattern is selected by said accompaniment rhythm pattern designation circuit and producing a second accompaniment rhythm sound when a second accompaniment rhythmpattern is selected by said accompaniment rhythm pattern designation circuit, said sound source switching from said first to said second accompaniment rhythm sound a predetermined time after said accompaniment rhythm-pattern designation circuit is switched from said first to said second accompaniment rhythm-patterns,

a means for generating a beat number determination signal synchronized to the accompaniment rhythm sound,

a means for generating a fill-in rhythm signal,

a means for superimposing a fill-in rhyth onto the accompaniment rhythm sound in response to a designation of a switch-over of accompaniment rhythm-pattern, said means for superimposing operating to superimpose said fill-in rhythm during said predetermined time, and

a means for stopping the superimposed fill-in rhythm in synchronization with the beat number determination signal, said means for stopping operating to stop the fill-in rhythm after said sound source has switched from said first to said second accompaniment rhythm sound.

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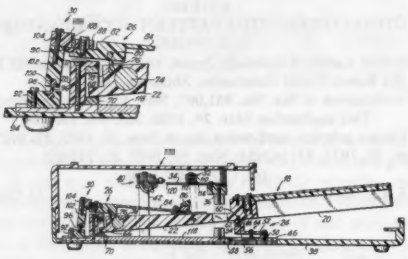
**4,314,494**

## ELECTRIC KEYBOARD MUSICAL INSTRUMENT

**Paul de Vries, 38 W. 10th St., New York, N.Y. 10011**

**Filed Nov. 19, 1979, Ser. No. 95,558**
**Int. Cl.³ G10H *3/00***
**U.S. Cl. 84—1.06** **11 Claims**



1. An electric keyboard musical instrument comprising:

supporting means;

a plurality of vibratile reeds, each having a free end and its other end fixedly attached to the supporting structure;

a plurality of actions, each being associated with a reed;

each action including

a key having a head and a tail,

a hammer assembly including a hammer mounted on the key tail,

an escapement,

and flexible and resilent key hinge means for connecting the key to the supporting structure;

said hammer assembly connected to the tail of the key by hinge and biasing means and when at rest in contact with the escapement and initially restrained thereby, whereby when the key head is depressed the key tail rotates about the key hinge causing the hammer assembly to overcome the resistance of the escapement so that the hammer strikes the reed at a specific point causing it to vibrate;

pickup means in spaced relation to the free end of the reed for generating an electric oscillation signal from the vibrating reed.

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**4,314,495**

## PIEZOELECTRIC SADDLE FOR MUSICAL INSTRUMENTS AND METHOD OF MAKING SAME

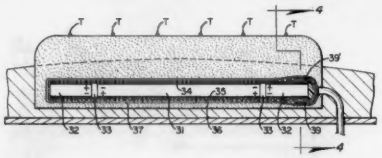
**Lloyd R. Baggs, 316 1/2 W. Pico Blvd., Los Angeles, Calif. 90015**

**Filed Nov. 8, 1979, Ser. No. 92,582**
**Int. Cl.³ G10H *3/18***
**U.S. Cl. 84—1.16** **24 Claims**

1. In a stringed instrument having a soundboard and a bridge portion over which a plurality of strings are passed, a piezoelectric saddle comprising:

an elongated body provided with an upper string support surface and an internal cavity extending the length of said body, means adapted for securing said body to said bridge portion with the length of said body aligned in a direction transversely of said strings;

an elongated piezoelectric transducer member extending through the internal cavity in said body and in a direction parallel to the length of said body, said transducer member subtending said strings, said elongated piezoelectric transducer member defining a first transducer extending through the internal cavity in a direction parallel to the length of said body, and a second transducer extending in spaced parallel relation to said first transducer along the



length of said internal body, and electrically conductive lead interconnecting positive terminals of said first and second transducers, and means grounding said first and second transducers through said saddle;

electrode members disposed in spaced relation to one another on parallel surfaces of said transducer member such that said terminals are of opposite polarity, and electrical leads extending from said electrodes members; and

means encasing said transducer member within said body and integrating said transducer and said body into a unitary elongated, rigid member.

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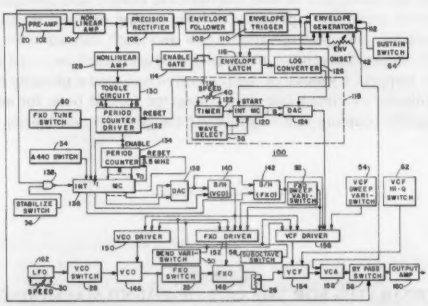
**4,314,496**

## MUSIC SYNTHESIZER

**Michael L. Beigel, Warwick, N.Y., assignor to Donald L. Tavel, Indianapolis, Ind.**

**Filed Jun. 7, 1979, Ser. No. 46,443**
**Int. Cl.³ G10H *1/057, 1/46***
**U.S. Cl. 84—1.26** **15 Claims**



1. A music synthesizer controllable to provide a synthesized sound in response to an input signal derived from a musical sound, said input signal having a fundamental frequency and a rising amplitude portion, said synthesizer comprising:

means responsive to said input signal for generating a unipolar signal which follows the amplitude of said input signal;

means for generating a controllable frequency signal related to said fundamental frequency;

envelope signal generating means responsive to said unipolar signal for providing a controllable envelope signal which increases in a controllable manner to a maximum amplitude related to the maximum amplitude of said input signal and which thereafter decreases in a manner related to the decrease of said input signal; and

amplifier means for amplifying said frequency signal with a

gain determined by said envelope signal for providing said synthesized output signal;

wherein said means for generating said unipolar signal further includes means for generating a maximum amplitude signal relating to the maximum achieved amplitude of said unipolar signal; and

wherein said envelope signal generating means responds to said maximum amplitude signal in providing that portion of said envelope signal which increases to its maximum amplitude and responds to said unipolar signal in providing that portion of said envelope signal after said maximum amplitude is reached.

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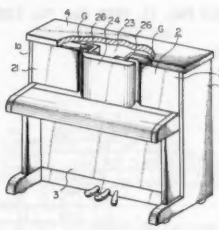
**4,314,497**

## PIANO CONSTRUCTION FOR ENRICHED STEREOPHONIC TONAL RADIATION

**Hideo Yamashita, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan**

**Continuation of Ser. No. 919,724, Jun. 27, 1978, abandoned. This application Sep. 2, 1980, Ser. No. 183,309**
**Claims priority, application Japan, Jul. 1, 1977, 52-87223**
**Int. Cl.³ G10C** *3/02*
**U.S. Cl. 84—177** **12 Claims**



1. An improved piano construction for enriched stereophonic tonal radiation, comprising:

a resonant cavity including a front board defining a front end of said cavity, said resonant cavity having first, second and third areas in which treble, mid-range and base tones, respectively, predominate;

first and second tone radiating slits formed in said front board; said first and second slits being the only tone radiating slits formed in said front board; said first slit having a shape and location corresponding to one of said first, second and third areas so that said first slit radiates primarily a first tone range from within said cavity to the area in front of said front board whereby said slit operates primarily as a firt tone range source; said second slit having a shape and location corresponding to a different one of said first, second and third areas such that said second slit radiates primarily a second tone range different than said first tone range from within said cavity to the area in front of said front board whereby said second slit operates primarily as a second tone range source; and

each of said slits having an exponentially diverging shape which causes the tones radiated thereby to radiate over a wide area in front of said front board.

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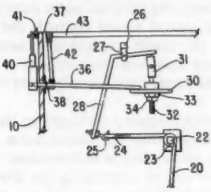
**4,314,498**

## DRUM HAVING INTERNAL DOUBLE ACTING CONTROL TO PROVIDE VARIABLE PITCH

**David P. Hofstad, 1005 S. Glendale, Sioux Falls, S. Dak. 57105**

**Filed Jun. 17, 1980, Ser. No. 160,206**
**Int. Cl.³ G10D** *13/02*
**U.S. Cl. 84—411 A** **5 Claims**

1. Drum means including a drum body and a drum head stretched over said body, stand means attached to said body and adapted to hold it, said stand means including legs and a central post means supported by said legs, pedal mounting means on said post means, a pedal pivotally mounted on said mounting means, control means including a disc means mounted within said body and operably connected to said pedal, lever means pivoted to said body on a pivot axis adjacent to said body, said lever means extending adjacent to and adapted to be engaged by said disc means, each of said levers extending through an opening in said body and interior and exterior link means attached to each of said levers, said exterior link means being outside of said body and attached to the



periphery of said drum head, and said interior link means being within said body and connected to said lever means at a point on the opposite side of said pivot axis from said exterior link means whereby tilting of said lever means about said pivotal axis causes said interior link means to move in a direction opposite to said exterior link means, said interior link means being connected to head tensioning means operably engaged with said drum head interior of said body to press against said head while the exterior link means is pulling on said periphery.

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**4,314,499**

## MUSICAL INSTRUMENTS FACILITATING TEACHING, COMPOSING AND IMPROVISATION

**Donald Olsen, 15 Cedar Pl., Sea Cliff, N.Y. 11579**

**Continuation-in-part of Ser. No. 899,086, Apr. 24, 1978, abandoned. This application Sep. 12, 1979, Ser. No. 74,662**
**Int. Cl.³ G10D** *3/00;* **G09B** *15/02*
**U.S. Cl. 84—485 R** **5 Claims**

1. A device for a musical instrument wherein both the device and the musical instrument for which it is designed used as their musical base the chromatic even tempered 12 tone scale, which device is either built into or placed upon the instrument itself, and, wherein the device provides a display means upon the fingerboard of the instrument consisting of lighting, illumination or designation means showing the exact place or places on the instrument where a string or strings are to be stopped, depressed or fingered with the fingers of one hand so that the note or combination of notes so selected as indicated by the display means can be plucked, strummed or played with the fingers of the other hand; and control means providing for user activation of the aforesaid display means; wherein the improvement comprises:

(a) a plurality of lights or other illumination or designation means located on or near the fingerboard of the instrument itself wherein each individual light, illumination or designation means is placed so as to display the exact

location on the fingerboard where each and every string or any part of them is to be stopped, depressed or fingered by the fingers of one hand so that a selected note or notes as displayed on the fingerboard can be played by the fingers of the other hand simultaneously plucking, strumming or playing the same string or strings so stopped as indicated; and

(b) with a plurality of switches, each switch controlling the illumination or activation of the display means for one pitch class on any part of one or all of the strings on the instrument where the selected notes naturally occur, and, which switch control means controls the illumination or activation of the display means associated with a pitch class separately from and independent of other switches controlling the display means associated with other pitch classes; and

(c) with the wiring circuitry arranged so that activation of one switch controlling the illumination of the display means of one pitch class is independent of and separate from any other circuit controlling the illumination or the designation of the display means of any other pitch class and with the stopping point displays of all notes of any given pitch class connected together so that all stopping points of any activated pitch class can be displayed simultaneously on all their locations on or near the fingerboard of the instrument used where the selected note naturally occurs; and,

(d) which switches are activated by the player with input chosen by the activation of individual switches or combinations of switches which switches control the illumination or activation of the display means located on or near the fingerboard of the instrument used and from out of the plethora of actuated or illuminated display means indicating a plurality of all notes of a selected pitch class possible to play on any part of the strings of the instrument used, the player can pick and choose from each pitch class involved; and

(f) which pattern of selection of pitch classes first chosen by the activation of selected switches can be changed by using the same matrix of switches which original selection and subsequent change conform to musical theory both in input and output and which pitch classes chosen are multiplely displayed by the display means on or near the fingerboard of the instrument used at the precise places to be stopped by one hand in order to sound any notes of the selected pitch class with the other hand.

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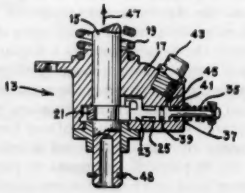
**4,314,500**

## INSTANTANEOUS OPENING POSITIVE LOCK MECHANISM

**James C. Hoppe, Redondo Beach, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Jan. 25, 1980, Ser. No. 115,514**
**Int. Cl.³ F42B *15/10***
**U.S. Cl. 89—1 B** **1 Claim**




1. An instantaneous opening positive lock mechanism comprising a body portion having a vertically oriented cylindrical opening therethrough, an actuating rod disposed in the cylindrical opening in said body portion for slidable movement therein, a circular groove around the circumference of said rod, a locking spring ring disposed in said circular groove for holding said rod in locked position in said body, a piston cam in alignment with said locking spring ring, said piston cam being positioned in a horizontally oriented cylindrical opening in said body portion for slidable movement therein, means on said piston cam for opening said ring when said piston cam is urged inward, said ring opening means including a wedge portion on the innermost end of said piston cam for engaging wedge faces on said locking spring ring whereby inward movement of said piston cam causes said ring to open and release said rod to allow vertical movement of said rod in response to forces acting thereon, and an internal mortise groove positioned on the innermost end of said piston cam, said mortise groove engaging upstanding mortise lugs on said locking ring to provide a positive locking capability and prevent opening of said locking ring until said piston cam is moved inward.

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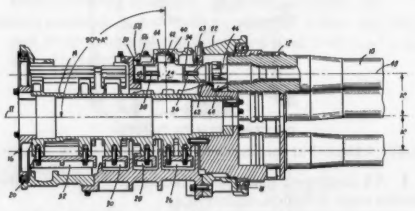
**4,314,501**

## HIGH RATE OF FIRE REVOLVING BATTERY GUN

**Robert G. Kirkpatrick, Shelburne, and Ronald R. Snyder, Georgia, both of Vt., assignors to General Electric Company, Burlington, Vt.**

**Filed Feb. 11, 1980, Ser. No. 120,442**
**Int. Cl.³ F41D *7/02***
**U.S. Cl. 89—12** **5 Claims**



1. A Gatling type gun including:

a housing;

a rotor journaled in said housing for rotation about a longitudinal axis;

said rotor including:

a plurality of gun barrels, each having a respective longitudinal axis, disposed in an annular row, each of said gun barrels fixed to said rotor with its respective longitudinal axis at an included angle A to said longitudinal axis of said rotor, said included angle A being neither 0° nor 180°, and

a like plurality of gun bolt assemblies, each having a respective longitudinal axis, disposed in an annular row, each of said gun bolt assemblies mounted to said rotor with its respective longitudinal axis coaxial with the respective longitudinal axis of a respective gun barrel.

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**4,314,502**

## SAFETY CONTROL SYSTEM FOR DOUBLE-ACTING CYLINDER

**Edwin P. Brinkel, Royal Oak, and Philip J. Dellach, Utica, both of Mich., assignors to ISI Fluid Power, Inc., Fraser, Mich.**

**Filed Jan. 15, 1979, Ser. No. 3,411**
**Int. Cl.³ F15B *13/042***
**U.S. Cl. 91—438** **2 Claims**

1. In combination with a double-acting cylinder assembly, including a cylinder with pressure and exhaust ports, a piston defining opposed differential areas and piston rod, a cylinder control valve having a spool having a central position and a pair of control positions, with pressure, cylinder and exhaust ports, cylinder conduits between said control valve cylinder

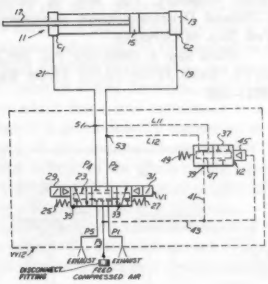
ports and said cylinder ports respectively, a pressure conduit connected at one end to said control valve pressure port and having a open end; and a source of compressed air including a pressure passage means having a disconnect fitting removably connected to said pressure conduit open end;

said pressure conduit on disconnection from said source of compressed air adapted for communication to atmosphere;

a safety control system for said cylinder assembly comprising a pilot operated valve including a housing having a pressure port connected to said pressure conduit, a pilot port connected to said pressure conduit, said pressure and pilot ports being connected to said pressure conduit between said disconnect fitting and said cylinder control valve, and a pair of cylinder ports connected to said cylinder conduits respectively;

a valve spool in said housing having first and second control positions therein;

operative means on said housing normally biasing said safety valve spool to a first control position connecting said safety valve pressure port to both of its cylinder ports and to opposite ends of the cylinder assembly;




a build up of pressure to said pilot port adapted to move the safety valve spool to its second control position, blocking communication between said safety valve pressure port and its cylinder ports;

said cylinder control valve normally controlling the respective movements of said piston;

the spool of said cylinder control valve when in its normal central position, blocking the conduits therefrom to said cylinder assembly ports, both sides of said piston being pressurized;

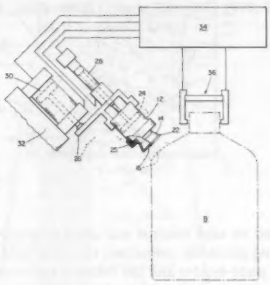
said safety valve spool automatically returning to its first position, on disconnecting said pressure conduit from said source of compressed air, opposite ends of said cylinder bleeding through said pilot operated valve pressure port and through said pressure conduit to atmosphere;

whereby in the event of a failure in the cylinder assembly with the cylinder control valve spool in its central position and pressurized air trapped upon opposite sides of said piston, on disconnecting said air pressure conduit from said source of compressed air, the trapped air from opposite ends of said cylinder assembly is dumped through said pilot operated valve and through said pressure conduit to atmosphere.

## 4,314,503
## STENCIL PRINTING

**Andrew G. Perra, Jr., and George H. Sparhawk, Jr., North Swanzey, both of N.H., assignors to Markem Corporation, Keene, N.H.**

**Filed Dec. 18, 1979, Ser. No. 104,801**
**Int. Cl.³ B41F *17/00***
**U.S. Cl. 101—41** **2 Claims**



1. Stencil printing apparatus adapted for printing on a curved or irregular underlying surface, comprising:

a rigid housing member having side wall means providing a chamber for enclosing a quantity of printing fluid

elastically compressible and deformable supporting wall means mounted on one end of said housing member and extending beyond said housing member side wall means providing an axial extension of said chamber, the outer edge of said supporting wall means being normally generally perpendicular to said side wall means of said chamber

a flexible stencil screen having its outer peripheral edge sealingly mounted on said outer edge of said supporting wall means and extending thereacross normally generally perpendicular to said side wall means of said chamber to form an end wall of said chamber, said stencil screen including its outer pheriphal edge being deformable into continuous contact with said underlying surface and with said supporting wall means being elastically compressed thereby

print cylinder means for moving said housing member and wall means to contact said stencil with a surface to be printed

piston means mounted in said chamber adjacent the other end of said housing member for transmitting pressure to said printing fluid to extrude said printing fluid through said stencil screen when said stencil screen is in contact with said underlying surface to be printed, and

common control means for actuating said print cylinder means and said piston means.

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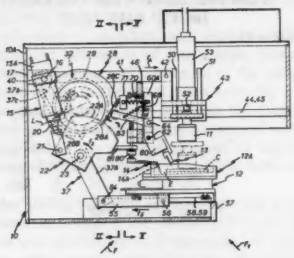
## 4,314,504
## PAD TRANSFER PRINTING MACHINE

**Guy Combeau, Paris, France, assignor to Machines Dubuit, Paris, France**

**Filed Feb. 1, 1980, Ser. No. 117,552**
**Claims priority, application France, Feb. 1, 1979, 79 02655**
**Int. Cl.³ B41F *1/16, 17/00***
**U.S. Cl. 101—41** **11 Claims**

1. A pad transfer printing machine comprising a plate-holder carriage, means for mounting said plate-holder carriage for horizontal movement for inking a printing plate between a forward position and a return position, a pad-holder carriage, means for mounting said pad-holder carriage for horizontal movement between an image-receiving return position and a forward printing position, common control means for controlling the horizontal movements of both of said carriages, said common control means comprising a control rod pivotally

mounted above a fixed pivot and defining a pair of arms extending respectively to opposite sides of said pivot, a pneumatic actuator for imparting pivotal reciprocating movement to said control rod about said fixed pivot, two links pivotally



connected to said control rod arms respectively, one of said links being pivotally connected to one of said control rod arms and said plate-holder and the other of said links being pivotally connected to the other of said control rod arms and said pad holder.

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**4,314,505**

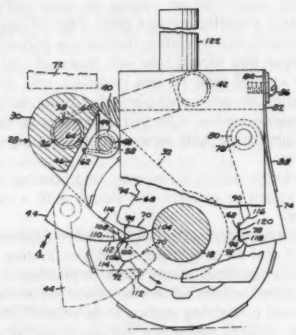
## ROTARY WHEEL TYPE MARKING HEAD

**Frank Krembel, Jr., St. Clair Shores, Mich., assignor to Columbia Marking Tools, Inc., Detroit, Mich.**

**Continuation of Ser. No. 951,252, Nov. 16, 1978, abandoned. This application Sep. 11, 1980, Ser. No. 186,343**

**Int. Cl.³ B41J** *1/44*

**U.S. Cl. 101—85** **22 Claims**



**1.** In a marking head having a frame which supports a shaft, at least one marking wheel on said shaft rotatable relative to said frame to align successive circumferentially arrayed marking portions thereon with workpieces, a cam wheel operably connected with each said marking wheel for rotation therewith and having a circumferential series of radially inward recesses, one for each said marking portion, a retainer pawl carried by said frame and being releasably engageable under a spring bias with successive recesses to retain successive marking portions in workpiece alignment, and actuating means carried by said frame and engageable successively with said recesses to advance successive marking portions into said alignment, improved structure wherein each said recess has two surface portions spaced circumferentially apart, said surface portions extending along lines disposed at opposite angles relative to a radius of said cam wheel passing between said surface portions, said retainer pawl having surface portions configured and oriented to engage said surface portions of said recess along said lines when said retainer pawl is engaged in said recess, said surface portions when interengaged being relatively movable along a said line to facilitate rotation of said marking wheel under the influence of force on a said marking portion incidental to engagement with a workpiece, said angles and the length of interengagement of said surface portions being so correlated that one pair of said interengaged surface portions remains interengaged despite said rotation in either direction by about one-half the circumferential extent of a said marking portion, said spring bias and one pair being cooperable to return said marking wheel through said circumferential extent responsive to relief of said force, and said actuating means has a forward edge face normally extending into one of said recesses and disengaged from said one recess to provide a clearance between said forward edge face and said recess when both of said retainer pawl surface portions are each simultaneously interengaged with their associated one of said two surface portions of another recess engaged by said retainer pawl, whereby retrograde rotation of said marking wheel within predetermined limits in response to force on a marking portion incidental to its engagement with a workpiece does not apply force to said actuating means thereby avoiding breakage of said actuating means.

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**4,314,506**

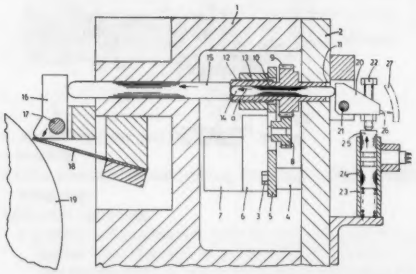
## PRINTING MACHINE DOCTOR BLADE ADJUSTMENT APPARATUS

**Werner Rees, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach, Fed. Rep. of Germany**

**Filed Sep. 9, 1980, Ser. No. 185,390**

**Int. Cl.³ B41F** *31/04, 33/00, 31/06;* **B41L** *27/06*

**U.S. Cl. 101—365** **8 Claims**



**1.** In a printing machine, a doctor blade adjustment apparatus having

a support (**1**);

a doctor blade (**18**) located on the support;

a positioning element (**15**) located in motion transfer relation to the doctor blade;

an actuating pin (**10**) engageable with the positioning element;

and means (**6–9**) controlling the axial position of the actuating pin (**10**) to, in turn, control via the positioning element the position of the doctor blade,

comprising, in accordance with the invention,

an actual position sensing means including an axial throughbore formed in said actuating pin (**10**);

a feeler pin (**14**) located in said bore;

spring means (**23**) pressing said feeler pin in axial end engagement with a face of the positioning element;

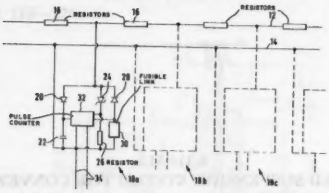
and indicating means (**24, 25; 26, 27**) coupled to the feeler pin for indicating the actual position of the feeler pin as pressed against the positioning element and hence of the doctor blade even in the presence of a gap between the actuating pin and the positioning element.

4,314,507

## SEQUENTIAL INITIATION OF EXPLOSIVES

Peter C. Seligmann, Johannesburg, South Africa, assignor to AECI Limited, Johannesburg, South Africa

Filed May 14, 1979, Ser. No. 34,133
Int. Cl.[3] F42C *11/06*; F42D *1/00*
U.S. Cl. 102—217 8 Claims




1. A circuit for use in the sequential initiation of explosives comprising up-down counter means having a first input terminal at which an up-count is initiated, a second input terminal at which a down-count is initiated and an output terminal,

energy storage means for powering the counter means,

first impedance means which has a low impedance for a fixed time to current of a particular value and of a first polarity and which thereafter has a high impedance connected to one of the input terminals of the counter means so that when current of the first polarity and of the particular value is passed through the first impedance means a signal is applied after the fixed time to the input terminal to initiate a count in a first direction, and second impedance means which has a low impedance to a predetermined voltage of a given polarity connected to the other input terminal of the counter means so that when the predetermined voltage of the given polarity is applied to the second impedance means a count is initiated in a second direction opposite to the first direction,

the counter means generating an output signal at its output terminal for actuating a detonator device when the count in the second direction reaches a predetermined value.

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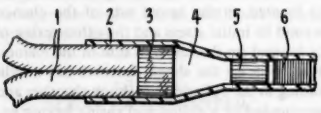
4,314,508

## DEVICE WITH INCENDIARY FUSECORD IGNITED BY DETONATION

Thomas L. Love, Deer Park, Australia, assignor to ICI Australia Limited, Victoria, Australia

Filed Feb. 22, 1979, Ser. No. 14,248
Claims priority, application Australia, Mar. 17, 1978, PD3747
Int. Cl.[3] C06C *5/04*
U.S. Cl. 102—275.7 11 Claims



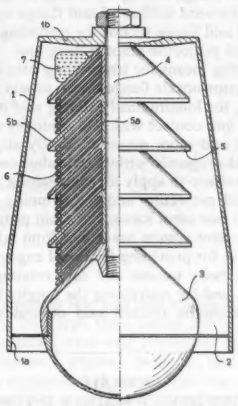

1. A fuse device for the ignition of incendiary fusecord by a detonation, said device comprising at least one length of incendiary fusecord in a contiguous relationship with an incendiary igniting means capable of igniting the core of said fusecord and comprising an incendiary initating means separated by a gap from the said igniting means, and being capable of being ignited by a detonation whereby burning particulate debris is propelled across said gap onto said igniting means to thereby ignite the latter the part of said fusecord contiguous to said igniting means, the initiating means and the igniting means being located in a tubular container.

4,314,509

## PYROTECHNIC CHARGE, WITH A SHORT COMBUSTION TIME, COMPRISING INCLINED PLATES OF PROPELLANT AND DEFLECTORS, AND A PROPULSION SYSTEM USING A CHARGE OF THIS TYPE

Francis A. Dalet, Tresses, France, assignor to Societe Nationale des Poudres et Explosifs, France

Filed Dec. 20, 1979, Ser. No. 105,562
Claims priority, application France, Dec. 28, 1978, 78 36724
Int. Cl.[3] C06D *5/00*
U.S. Cl. 102—288 6 Claims



1. Pyrotechnic charge which comprises a set of plates of solid propellant, which plates are arranged approximately parallel to one another and provide at least one longitudinal channel for discharging the combustion gases in the direction of the nozzle of the propulsion system, these plates of propellant being inclined towards this longitudinal channel, deflectors which are arranged approximately parallel to the plates of propellant and which possess, in a longitudinal cross-section of the charge, a length which is greater than the length of the plates of propellant, said deflectors being separate members from the plates of propellant and being intercalated between the plates of propellant, the longitudinal channel for discharging the gases being located at the periphery of said charge.

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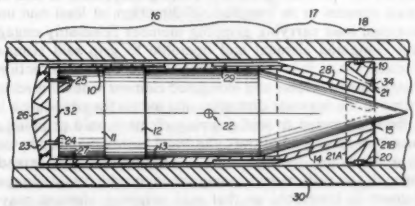
4,314,510

## KINETIC SABOT SYSTEM

Thomas R. Jeter, Bel Air, and William F. Donovan, Aberdeen, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 28, 1980, Ser. No. 115,819
Int. Cl.[3] F42B *3/16*
U.S. Cl. 102—523 14 Claims




1. A kinetic projectile-sabot system for use in a smooth bore barrel comprising:

a projectile having a rotating band operatively positioned aft of its center of gravity and positioned intermediate to a

conically shaped nose end, and a rear end having a plurality of closed apertures disposed therein;

sabot means, having a body section slidably disposed in said barrel and separated therefrom by a predetermined clearance, said clearance, in combination with propellant gases of said projectile providing a fluid dynamic bearing to assist in the guidance of said projectile-sabot system within said barrel, a conically shaped forward section disposed intermediate said body section and a full bore obturator-nozzle flange means in combination and substantially enclosing said projectile, said flange section being substantially the forward most section of said projectile, said flange having a plurality of nozzles extending from the forward surface of said flange section to the aft surface of said flange section for providing obturation and spin to said projectile-sabot system; and

sabot base plug means for transferring torque generated by said obturator-nozzle flange means to said rear end of said projectile, for longitudinally sliding said nose end of said projectile into contact with said conically shaped forward section of said sabot means to axially align and radially secure said projectile within said sabot means, for allowing gas pressure to apply an accelerating force to the aft end of said projectile, and for stripping said base plug means and said sabot means from said projectile after said projectile-sabot system has exited from said barrel;

friction means for providing frictional engagement between said sabot body section and said rotating band of said projectile, and for restraining the longitudinal movement of said projectile toward said obturator-nozzle flange means.

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**4,314,511**

## TRANSPORT DEVICE MAINLY INTENDED FOR PULLING TREE TRUNKS AND SIMILAR LOADS

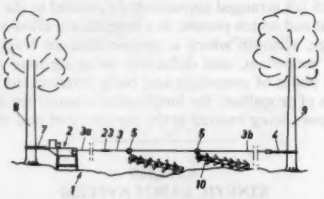
**Leif Bogren, Radavägen 59, Mölndal, Sweden (431 36)**

**Filed Aug. 9, 1979, Ser. No. 64,987**

**Claims priority, application Sweden, Aug. 24, 1978, 7808923**

**Int. Cl.³ B66C *21/00***

**U.S. Cl. 104—173 R** **10 Claims**



1. A transport device for transporting a load along a path of transport between at least two points comprising, an elongated element extending along the path of transport, an anchoring member attached to one end of said elongated member, a driving means attached to the other end of said elongated element for producing a reciprocating movement of said elongated element in its longitudinal direction, at least one unidirectional load carrying gripping member releasably engaging said elongated element and operable to grip said elongated element when it is reciprocating in the desired direction of transport and release said elongated element when it is reciprocating in the opposite direction, and means for attaching a load to be transported to said gripping element, said gripping element comprising a hollow cylindrical casing member having a bore extending therethrough, a longitudinal slot extending through the wall of said casing through which said elongated element is insertable so that said gripping element may be engaged with and removed from said elongated element, releasable retaining means for retaining said gripping element in engagement with said elongated element, unidirectional locking members in said casing operatively associated with said elongated element to move said gripping member along the path of transport, and a releasing member attached to said elongated element at a desired unloading position to cooperatively engage said gripping member to release said retaining means and remove said gripping member from engagement with said elongated member.

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**4,314,512**

## DAMPED SUSPENSION SYSTEM FOR CONVEYORS

**Thomas Gerhard, Hirschberg-Leutershausen, and Ulrich Giesen, Krefeld, both of Fed. Rep. of Germany, assignors to Waggonfabrik Uerdingen AG, Krefeld, Fed. Rep. of Germany**

**Filed Mar. 31, 1980, Ser. No. 135,620**

**Claims priority, application Fed. Rep. of Germany, Apr. 14, 1979, 2915236**

**Int. Cl.³ B61B *13/04, 13/02***

**U.S. Cl. 105—149** **7 Claims**

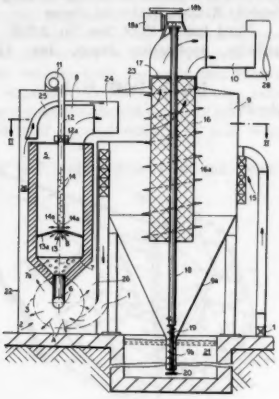
4. A damped suspension system for reducing transverse swinging of an element having an undercarriage and depending from an overhead carrier cable while the element is moving forwardly in a straight line and for limiting lateral inclination thereof relative to the carrier cable, comprising a pair of shock absorbers associated to the undercarriage and connected to the element; a pair of prestressed springs each associated with one of said shock absorbers to act in parallel therewith and exerting a force on the element for compensating swinging motions thereof; means associated to each of the two springs for actuating the respective spring in such a manner that upon an inclination of the element the one spring associated to the shock absorber located on the raised side of the element, exerts a force beyond its initial stress and the other spring of the shock absorber located on the lowered side of the element, becomes ineffective, wherein the shock absorber has a cylinder and a piston sliding in the cylinder; the shock absorber and the spring being surrounded by a cylindrical casing having an upper face fixed to the cylinder and a bottom face so developed as to have inwardly projecting tongues at a distance to each other, two respective tongues defining a recess in between; and wherein the bottom face of the casing is cooperating with a sleeve having a bottom side fixed to the piston and an upper side provided with outwardly projecting tongues at a distance to each other, wherein two respective tongues define a recess in between, in such a manner that the tongues of the casing are projecting into the respective recesses of the sleeve and the tongues of the sleeve are projecting into the respective recesses in the casing so that the spring is encased by the casing and the sleeve.

**4,314,513**

## METHOD AND APPARATUS FOR THE INCINERATION OF STALKS, ESPECIALLY OF STRAW

**Franz Berthiller, A 3473 Winkl 22, Lower Austria, Austria, assignor to Franz Berthiller, Winkl, Austria**

**Filed Jun. 26, 1980, Ser. No. 163,399**
**Claims priority, application Austria, Jun. 28, 1979, 4535/79**
**Int. Cl.³ F23G 5/04**
**U.S. Cl. 110—224** **14 Claims**



1. An apparatus for the incineration of stalk crop material comprising:

(a) cutter means for severing stalks of said crop material into pieces;

(b) a pneumatic conveyor for receiving said pieces and pneumatically displacing same in a conveying air stream to a combustion station;

(c) a first separator at said station for separating said conveying air stream from said pieces;

(d) a compacting conveyor for withdrawing said pieces from said separator and compacting said pieces at said station into a body of said pieces;

(e) a shaft furnace forming a combustion chamber receiving said body of pieces from said compacting conveyor for sustaining destructive distillation of said pieces below an exposed surface of said body in said chamber;

(f) means for feeding fresh air to said chamber for combustion of combustible gases and said body at said surface, thereby producing ash entrained by a hot gas from said chamber;

(g) a hood at an upper end of said shaft furnace for collecting said hot gas with entrained ash; and

(h) an ash separator connected to said hood for separating ash from said hot gas.

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**4,314,514**

## SUGAR CANE PLANTER

**Johann V. Binder, Cardier Rd., Wangan, Queensland, Australia (4860)**

**Filed Mar. 17, 1980, Ser. No. 131,008**
**Int. Cl.³ A01C 7/20**
**U.S. Cl. 111—3** **4 Claims**

1. A sugar cane planter including:

a wheel-mounted main frame,

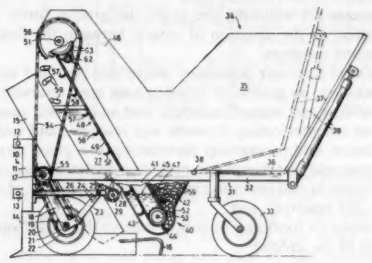
means for connecting the main frame to a tractor,

a drill plough mounted under the main frame,

a wheel-mounted trailer frame pivotally connected about a transverse axis at its front to the main frame,

a fixed tank adapted to contain a quantity of treating liquid on the trailer frame, said tank including side walls and downwardly convergent front and rear walls which define a closed tank bottom,

a hopper on the trailer frame adapted to carry a quantity of cane setts and to deliver them gravitationally into the tank, said hopper comprising a pair of fixed parallel sides and, between the sides, a bottom member hinged at its front to the back of the tank and a back member rigidly secured to the back of the bottom member, and means for raising the bottom and back members relative to said fixed sides and tank for ejecting cane setts from the hopper into the tank,



an elevator extending into said tank to elevate setts from the tank and to discharge them above the main frame, said elevator including transverse channelled cleats on endless sprocket-mounted chains, each of said cleats being adapted to engage and elevate at least one sett, and means for ejecting from each of said ascending cleats any setts carried by said cleat in excess of one, and

a chute assembly on the main frame adapted to receive such discharged cane setts and feed them gravitationally to a furrow opened by the drill plough.

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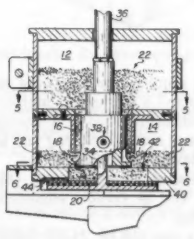
**4,314,515**

## SEED SINGULATOR

**Miguel A. Jimenez, Douglas, Ariz., and Manuel M. Saucedo, Blythe, Calif., assignors to Patrick O. Griffin, Yuma, Ariz., by said Manuel M. Saucedo**

**Filed Nov. 13, 1979, Ser. No. 93,499**
**Int. Cl.³ A01C 7/20, 5/06**
**U.S. Cl. 111—77** **4 Claims**



1. A seed singulator which comprises:

(a) a first member having an upwardly facing flat surface,

(b) a second member having a flat surface with a groove extending across the flat surface and having a width dimensioned to receive seeds of the type to be singulated in a single file, the flat surface of said second member being positioned on a first part of the flat surface of said first member so that a first portion of the flat surface of said second member including an end of the groove extends beyond the flat surface of the first member and the end of the groove extends beyond said first member,

(c) means for supplying seeds to a second part of the flat surface of said first member,

(d) means for moving said first and second members relative to each other to move the seeds toward the groove in a direction having a component along the groove, the groove forming an angle of less than 90 degrees relative to the direction of motion between said first and second members, the motion between said first and second members being rotary about a first axis, said second member having an opening eccentrically disposed relative to the axis, which opening defines the second part of the flat surface of said first member,

(e) means for adjusting the angle the groove forms with respect to the direction of motion between the first and second members,

(f) a seed reservoir positioned above said first and second members, an enclosure between said seed reservoir and said first and second members, and an enclosed passageway communicating between said reservoir and said enclosure, said passageway terminating at a given distance above said first member to provide a predetermined depth of seeds in said enclosure independent of quantity of seeds in said reservoir, and

(g) means for forming a furrow to receive the seeds from the end of the groove.

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**4,314,516**

## WORKPIECE GUIDE FOR SEWING MACHINES

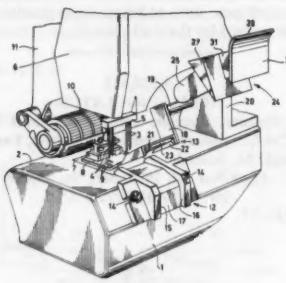
**Jean P. Touret, Chatillon, France, assignor to Rockwell-Rimoldi, S.p.A., Milan, Italy**

**Filed Dec. 17, 1979, Ser. No. 103,878**

**Claims priority, application Italy, Jan. 11, 1979, 19201 A/79**

**Int. Cl.³ D05B *35/10***

**U.S. Cl. 112—152** **4 Claims**



1. A device for simultaneously guiding separated strips of waistband material and a workpiece interposed therebetween to the stitching instrumentalities of a sewing machine of the type having a presser foot, a feed dog and an auxiliary transport device, said device comprising:

(a) a pair of U-shaped guide elements (**12-13**) mounted in spaced relation and in vertical alignment on the sewing machine including:

(i) sides defining legs (**15-16, 21-22**) respectively, with the legs of one of said guide elements extending toward those of the other;

(b) a dividing member (**24**) pivotably mounted on the sewing machine and selectively movable from an operative position between said guide elements (**12-13**) to a position displaced therefrom, said dividing member including:

(i) upper and lower guide elements (**27-28**) having exterior surfaces defining lid elements (**32-33**) for cooperating with said guide elements (**12-13**) respectively to form passageways for the separated strips of waistband material being advanced to the stitching instrumentalities; and

(c) means interconnecting said upper and lower guide elements (**27-28**) for guiding the workpiece being advanced with the strips of waistband material.

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**4,314,517**

## SEWING MACHINE WITH SUPPLEMENTAL WORK SUPPORTING SURFACE

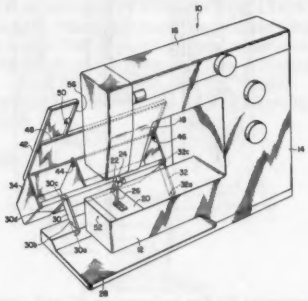
**Takahiko Kasahara, Anjoshi; Tukasa Yamaguchi, Aichiken; Shigeharu Shichi, Anjoshi; Masayuki Kato, Owariasahishi, and Senji Suito, Kariyashi, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariyashi, Japan**

**Filed Jan. 9, 1979, Ser. No. 2,003**

**Claims priority, application Japan, Jan. 13, 1978, 53-532472[U]**

**Int. Cl.³ D05B *73/10***

**U.S. Cl. 112—260** **3 Claims**



1. A sewing machine comprising:

a main base;

a base plate vertically separated from said main base;

a head extending from the main base,

a needle plate associated with the main base for supporting work fabric in position to be stitched, a line extending between said needle plate and said head, in the plane of said needle plate, defining a first direction,

a supplemental base connected to the main base through means of link mechanisms placed in a position in which the supplemental base is substantially in a plane including the main base and is immediately contiguous to the main base to present a continuously combined wider flat plane or placed in another position in which the supplemental base is substantially apart from the main base so that the main base is left alone and adapted to support a tubular fabric therearound wherein, said link mechanisms include a pair of parallel and identical length first links separated from one another in said first direction and each pivoted at one end thereof to the base plate for rotation in a plane perpendicular to said first direction, and a second link to which in turn are pivoted said first links at the other ends thereof, said supplemental base being pivotally mounted to the second link, said second link includes an edge portion in abutment with the main base and a wall in abutment with the length of one of the first links to cooperate under influence of gravity with the supplemental base so as to support the supplemental base on the second link in a plane in which lies the main base.

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**4,314,518**

## SIMPLIFIED SAILING SYSTEM

**Floyd Marsden, Garden City, Ga., assignor to Barbara B. Marsden, Garden City, Ga.**

**Filed Feb. 27, 1980, Ser. No. 125,360**

**Int. Cl.³ G01D *21/00***

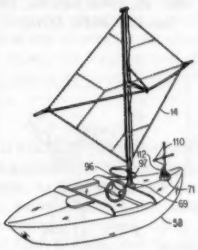
**U.S. Cl. 114—39** **16 Claims**

1. A method for sailing a wind-propelled vehicle comprising:

(a) providing means for maintaining knowledge of the appropriate wind direction sufficient to enable a novice to make appropriate positioning of a rig to safely operate said vehicle, including, a wind indication means rotatably supported on said wind propelled vehicle and operative for locating the wind direction, a wind indicator secured to said wind indication means, a first coded structure secured to said wind-propelled vehicle, with an identifiable code responsive to said wind indicator, a rotatable support member secured onto said wind-propelled vehicle and operative to support a plurality of sails, a rig positioning indicator secured to said rotatable support member, and a second coded structure secured to said wind-propelled vehicle, with the same said identifiable code thereon responsive to said rig positioning indicator;

(b) locating the wind direction by use of said wind indication means secured to said surface of said wind-propelled vehicle;

(c) placing said wind indicator on said wind indication means;




(d) securing to said wind-propelled vehicle said first coded structure around the base of said wind indication means, with said identifiable code thereon responsive to said wind indicator;

(e) rigging a plurality of sails for said wind-propelled vehicle on said rotatable support member;

(f) placing said rig positioning indicator secured to said rotatable support member;

(g) securing to said wind-propelled vehicle said second coded structure around said rotatable support member, with the same identifiable code thereon responsive to said rig positioning indicator; and

(h) moving said rotatable support member so that the rig positioning indicator identifies the same portion of said identifiable code on said second coded structure when said wind indicator identifies a similar portion of said identifiable code on said first coded structure;

whereby, when said rig positioning indicator identifies the same portion of said identifiable code on said second coded structure that said wind indicator identifies on said first coded structure, said plurality of sails are in the appropriate position for that particular wind direction.

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**4,314,519**

## BALLAST PUMPING SYSTEM

**Shigeto Yunoki, Tokyo, and Masataka Makizono, Sakado, both of Japan, assignors to Yamashita-Shinnihon Steamship Co., Ltd., Tokyo, Japan**

**Filed Feb. 26, 1980, Ser. No. 124,942**
**Claims priority, application Japan, Mar. 14, 1979, 54-029289**
**Int. Cl.³ B63B *39/03***
**U.S. Cl. 114—125** **3 Claims**

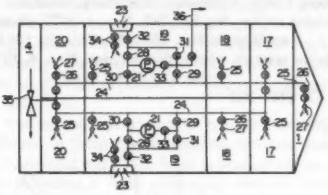
1. A ballast pumping system for pumping water ballast from or to the sea respectively to or from a plurality of ballast tanks provided within the hull of a ship, comprising:

a hydraullically operated submerged ballast pump located in one of said ballast tanks;

a sea chest provided in the bottom of the hull of said ship adjacent said ballast pump, said sea chest having an interior region in fluid communication with the sea;

outboard valve means for selectively directly connecting said sea chest and the ballast tank in which said sea chest is located;

first piping means for interconnecting said pump and said sea chest;




second piping means for interconnecting said pump and the respective bottom regions of each of said ballast tanks, said second piping means comprising a main pipe and a plurality of branch pipes, said main pipe being directly connected to said pump and each of said branch pipes interconnecting said main pipe with a respective one of said ballast tanks.

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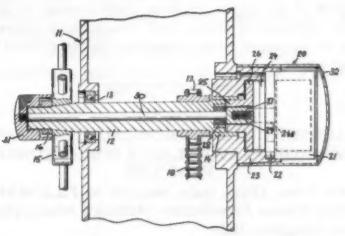
**4,314,520**

## STEERING MECHANISM FOR BOATS

**Stjepan Kosic, Sveavägen 49, 113 59 Stockholm, Sweden**

**Filed Apr. 16, 1980, Ser. No. 140,787**
**Int. Cl.³ B63H *25/00***
**U.S. Cl. 114—144 R** **3 Claims**



1. A steering mechanism for boats, comprising

(a) a support,

(b) a steering shaft rotatably mounted in the support,

(c) means for transmitting rotational motion of the steering shaft to a rudder operating device,

(d) a hand steering wheel secured to one end of the steering shaft, and

(e) a power actuator mounted on the support adjacent to the opposite end of the steering shaft and comprising

(i) a rotary motor,

(ii) a self-locking reduction gear with high gear ratio and including a driving shaft connected to the motor and a driven shaft coaxial with the driving shaft and the steering shaft, and

(iii) a clutch operatively positioned between the driven shaft of the reduction gear and said opposite end of the steering shaft, said clutch having a torque transmitting member coaxial with the driving shaft, the driven shaft and the steering shaft and being axially displaceable between an engaged position and a disengaged position, said torque transmitting member in said engaged position rotationally uniting the steering and driven shafts

and in said disengaged position permitting relative rotation of the steering and driven shafts.

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**4,314,521**

## METHOD AND APPARATUS IN THE TREATMENT OF UNDERWATER SURFACES OF FIXED OR FLOATING CONSTRUCTIONS

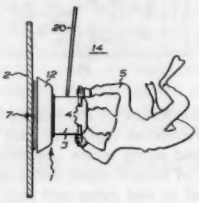
**Hans G. Lundberg, Löddeköpinge, Sweden, assignor to Trelleborg Marin Aktiebolag, Trelleborg, Sweden**

**Division of Ser. No. 848,795, Nov. 4, 1977, abandoned. This application Feb. 25, 1980, Ser. No. 124,045**

**Claims priority, application Sweden, Nov. 4, 1976, 7612280**

**Int. Cl.³ B63B *59/00***

**U.S. Cl. 114—222** **16 Claims**



1. Apparatus for cleaning underwater surfaces such as ships' hulls and the like comprising, in combination, a motor having a shaft, a substantially planar brush mounted on said motor shaft for rotation thereby and having a rear face and a front face for brushing contact with the surface to be cleaned, said shaft having an axial channel terminating in an open end adjacent said brush rear face, conduit means connected to an air supply above the water line for introducing air into said brush through said axial channel open end for emergence at said brush front face to thereby reduce the water resistance and power loss of the motor resulting from contact of the brush with the surrounding water, and means being provided for forming an insulation zone separating the brush from the surrounding water.

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**4,314,522**

## ACOUSTIC ELECTROPNEUMATIC SIGNAL GENERATOR, PARTICULARLY FOR AUTOMOTIVE VEHICLES

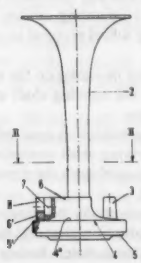
**Domenico Frigo, Olmo, Italy, assignor to F.I.A.M.M. S.p.A. Fabbrica Italiana Accumulatori Motocarri Montecchio, Montecchio Maggiore, Italy**

**Continuation of Ser. No. 951,157, Oct. 13, 1978, abandoned. This application May 6, 1980, Ser. No. 147,150**

**Claims priority, application Italy, Oct. 14, 1977, 22499/77[U]**

**Int. Cl.³ G10K *9/00, 9/12***

**U.S. Cl. 116—142 R** **9 Claims**



1. In combination, an acoustic signal generator for an automotive vehicle, comprising two horns each provided with a cornet and a generally cylindrical muff enclosing a membrane and having an end face joined to said cornet, and fastening means for securing said signal generator to a vehicle body, the muff of each horn carrying on said end face a radially extending boss which supports said cornet in coaxial relationship with said muff and is provided between the peripheral surface and the axis of said muff with an open-ended channel parallel to said axis and a narrower slot transversely communicating with said channel while opening onto said peripheral surface, said fastening means including a strap with a pair of extremities each connected to the muff of a respective horn by a removable screw with a polygonal head nonrotatably confined between walls of said channel and with a shank radially traversing said slot.

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**4,314,523**

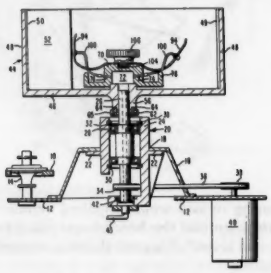
## CENTRIFUGE ROTOR APPARATUS FOR PREPARING PARTICLE SPREADS

**John W. Boeckel, Hamden; Vernon C. Rohde, Newtown, both of Conn., and John R. Wells, Culver City, Calif., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Mar. 19, 1980, Ser. No. 131,678**

**Int. Cl.³ B05C *13/00***

**U.S. Cl. 118—50** **9 Claims**



1. A centrifuge for depositing particles, suspended in a sample, on a deposition surface, said centrifuge comprising:

a rotor having a wall defining plural circumferentially located regions each adapted to receive one of said surfaces, each of said regions adapted to removably receive a chamber having an outlet orifice for removably engaging one of said surfaces and adapted to hold said sample in contact with said one surface,

a hollow drive shaft for mounting said rotor,

means for rotating said drive shaft,

a plurality of tube means each adapted to removably contact a different one of said chambers, thereby to interconnect said chambers with said hollow drive shaft for removing fluid from any said chamber in contact with said one surface.

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**4,314,524**

## APPARATUS FOR TRANSFER AND TREATMENT OF APERTURED ARTICLES

**Osamu Deguchi, Iwata, Japan, assignor to NTN Toyo Bearing Company, Limited, Osaka, Japan**

**Continuation-in-part of Ser. No. 926,200, Jul. 19, 1978, abandoned, which is a continuation of Ser. No. 698,594, Jun. 22, 1976, abandoned. This application Mar. 5, 1980, Ser. No. 127,447**

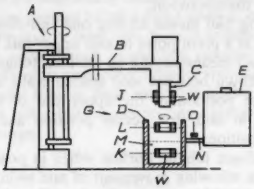
**Claims priority, application Japan, Jun. 24, 1975, 50-78952; May 7, 1976, 51-52500**

**Int. Cl.³ B05C *3/09, 13/02***

**U.S. Cl. 118—54** **5 Claims**

1. An apparatus for the transfer of an apertured article in sequential order from a loading station to a treating station and thereafter to a discharge station comprising: vertically dis-

posed frame element means; an arm member mounted at one end on the upper portion of said vertical frame element means in reversibly revolvable horizontal relationship thereto and also in vertically movable relationship thereto; first means for revolvablly moving said arm member back and forth in a horizontal plane and in sequential order from a loading station,




thereafter to a treating station, and finally to a discharge station; second means for vertically moving said arm member up and down on said frame element means; a chucking head mounted at the other end of said arm member in a revolvable state about a vertical axis of rotation for chucking an apertured article; and third means for rotating said chucking head at a high rate of speed about the vertical axis of rotation.

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**4,314,525**

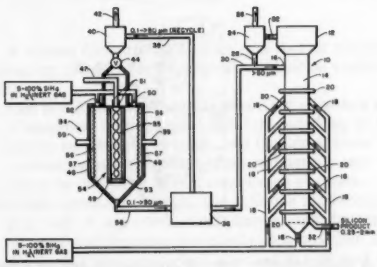
**FLUIDIZED BED SILICON DEPOSITION FROM SILANE**

**George C. Hsu, La Crescenta; Harry Levin, Woodland Hills; Richard A. Hogle, Arcadia; Ananda Praturi, Monrovia, and Ralph Lutwack, Sunland, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.**

**Filed Mar. 3, 1980, Ser. No. 126,324**

**Int. Cl.³ C23C *13/08***

**U.S. Cl. 118—716** **17 Claims**



1. An apparatus for producing silicon by thermally decomposing a silicon containing gas in the presence of fluidized nucleating seed particles of silicon comprising:

a primary fluidized bed reactor defining a primary fluidized reactor zone;

seed particle introduction means for introducing seed particles of silicon into said primary fluidized reactor zone;

means for introducing a fluidizing gas into said primary fluidized reactor zone to maintain said silicon particles in a fluidized suspension;

means for introducing a silicon containing gas into said primary fluidized reactor zone;

means for heating said primary fluidized reactor zone to a temperature sufficient to thermally decompose the silicon in said silicon containing gas to elemental silicon for deposition on said silicon seed particles;

means for removing excess fluidizing gas, unreacted silicon containing gas, reaction by-product gases and any entrained silicon particles therein from said primary fluidized reactor zone;

means for removing silicon seed particles having thermally decomposed silicon product thereon from said primary fluidized reactor zone; and

seed source means for supplying silicon seed particles to said seed particle introduction means, said seed source means including seed reactor means for thermally decomposing a seed generating gas containing silicon to form precursor silicon seed particles, said seed reactor having porous walls defining a pyrolysis seed reactor zone;

means for introducing said seed generating gas containing silicon into said pyrolysis seed reactor zone;

protective gas means for passing an inert gas through said porous reactor walls to provide a protective inert gas boundary to prevent deposition of silicon on said porous reactor walls;

means for heating said pyrolysis seed reactor to a temperature sufficient to thermally decompose said seed generating gas containing silicon to form precursor silicon seed particles including a heat generating element disposed internally within said pyrolysis seed reactor zone and including means for providing a protective, inert gas boundary surrounding said heat generating element to prevent contact of silicon with said heat generating element;

means for removing said precursor silicon seed particles from said pyrolysis seed reactor zone; and

means for transporting said precursor silicon seed particles to said seed particle introduction means for introduction into said primary fluidized reactor zone as said silicon seed particles.

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**4,314,526**

**MILK RECEPTACLE WITH DISCHARGE VALVE**

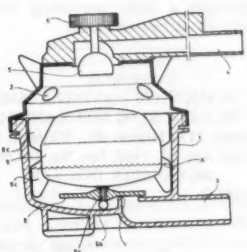
**Kjell Nordenskjold, Lidingo, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden**

**Filed Oct. 17, 1980, Ser. No. 197,816**

**Claims priority, application Sweden, Oct. 31, 1979, 7909007**

**Int. Cl.³ A01J *9/06***

**U.S. Cl. 119—14.55** **3 Claims**

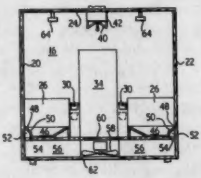


1. In combination with a milk receptacle, a valve for controlling the discharge of milk from the receptacle, said valve comprising a valve seat located at the bottom of the receptacle and having a generally horizontal sealing surface, valve means cooperating with the valve seat and including a circular disc having a central portion, the disc also having a part offset horizontally from said central portion and engageable with said sealing surface, a float for actuating said valve means, and means connecting the float to said central portion of the disc and so positioning the valve means that the valve seat is disposed eccentrically relative to the disc, said connecting means allowing tilting of the disc in a vertical plane to ensure gradual opening of the valve by a small opening force, said valve seat being generally triangular and having one of its points facing said central portion of the disc.

## 4,314,527
## REARING UNIT

John C. M. Shaw, Louth, England, assignor to Spotmanor Limited, Spilsby, England

Continuation-in-part of Ser. No. 943,092, Sep. 18, 1978, abandoned. This application Mar. 11, 1980, Ser. No. 129,304
Int. Cl.[3] A01K *1/00*; F24F *7/06*
U.S. Cl. 119—16 17 Claims

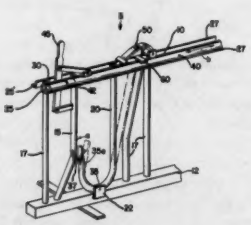


1. A rearing unit for farm animals comprising:
(a) a substantially closed rectangular body defined by floor, wall and roof structural elements and having at least one cage mounted therein which is adapted to have an animal disposed therein;
(b) means for supporting said body such that it is spaced from the ground to provide a restricted space between said floor and the ground;
(c) air inlet means formed in at least one of said structural elements in the upper portion of said body for allowing air to enter said body;
(d) air outlet means formed in at least one of said structural elements in the lower portion of said body through which air is withdrawn from said body; and
(e) air extraction means including exhaust outlet means disposed beneath said floor structural element for withdrawing air through said air outlet means from the body of said unit and through said air extraction means and exhaust outlet means, said exhaust outlet means being arranged to project said withdrawn air onto the ground;
(f) whereby the air withdrawn from said body of said unit by said air extraction means is expelled beneath said unit into said restricted space and onto the ground and said restricted space between said exhaust outlet means and the ground provides a choke preventing reverse air flow through said air extraction means.

## 4,314,528
## CATTLE STANCHION HAVING A SIMPLIFIED SELF-LOCKING MECHANISM

Boyd C. Fogleman, 2170 Herron Rd., Whitsett, N.C. 27377

Filed Apr. 28, 1980, Ser. No. 144,655
Int. Cl.[3] A01K *1/06, 1/08*
U.S. Cl. 119—147 R 9 Claims

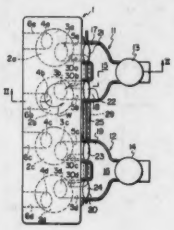


1. An improved locking mechanism for self-locking cattle stanchions of the type where each cattle station is defined by a stationary upright standard extending vertically between longitudinally extending upper and lower rails on one side of the cow's head and a generally upright swinging standard extending between the upper and lower rails on the other side of the cow's head, which swinging standard is automatically activated between a first inclined access position and a second upright locked position by the cow as its head is moved around when feeding, comprising:
(a) said upper rail formed by a pair of spaced walls slidably receiving and restraining the upper end of said swinging standard therebetween;
(b) a locking bail means having one end thereof pivotally attached at a pivot point to said upper rail, the other end of said bail means having an inclined tongue portion extending down between said spaced walls at a point between the position of the upper end of said swinging standard in said first access position and said second locked position;
(c) said inclined tongue portion when in position between said walls, allowing movement of said swinging standard underneath said tongue portion in a direction away from said pivot point from said first to said second position, and wherein when said swinging standard is in said second position said tongue portion extends below the upper end of said swinging standard to block movement of said swinging standard from said second to said first position.

## 4,314,529
## INTAKE SYSTEM OF A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Katsuhiko Motosugi; Hiroshi Takahashi; Shuhei Toyoda, all of Toyota; Toshiaki Konomi, and Hideaki Matsui, both of Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 2, 1979, Ser. No. 35,342
Claims priority, application Japan, Jul. 31, 1978, 53-92555
Int. Cl.[3] F02B *29/02, 31/00*
U.S. Cl. 123—52 MB 15 Claims



1. A multi-cylinder internal combustion engine which includes:
a cylinder block having a plurality of cylinders, each cylinder having a combustion chamber;
a cylinder head having a plurality of intake ports, each port leading to a respective combustion chamber through an intake valve which has a valve head;
an intake manifold having at least one intake passage common to at least two of said cylinders, said intake passage comprising a collecting portion having an inlet and at least two branch intake passages branched off from said collecting portion, each of said branch intake passages being connected to a respective one of said combustion chambers via a corresponding one of said intake ports;
at least two branch connecting passages, each branch connecting passage having an opening into a respective one of said at least two branch intake passages;
a common passage connecting said at least two branch connecting passages; and
valve means arranged in each of said branch intake passages at a location upstream of the openings of said branch connecting passages and opened in accordance with an increase in the level of the load of said engine, wherein the improvement comprises:

each intake port having a substantially horizontal portion connected to the respective branch intake passage and a downwardly inclined portion extending to the respective intake valve,

the opening of each of said branch connecting passages being located on the bottom wall of said downwardly inclined portion of the respective intake port in the vicinity of the corresponding intake valve head, and

said common passage being a blind passage communicating only with said at least two branch connecting passages, whereby each branch connecting passage during the intake stroke of its respective cylinder spouts gaseous matter drawn only from at least one other intake port via the at least one other branch connecting passage and the common passage.

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**4,314,530**

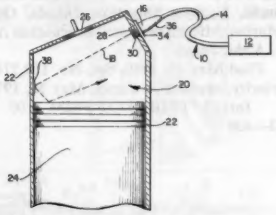
## AMPLIFIED RADIATION IGNITER SYSTEM AND METHOD FOR IGNITING FUEL IN AN INTERNAL COMBUSTION ENGINE

**Anacleto D. Giacchetti, 13100 Maple Ave., Lemont, Ill. 60439**

**Filed Feb. 25, 1980, Ser. No. 124,592**

**Int. Cl.³ F02P *23/04***

**U.S. Cl. 123—143 R** **8 Claims**



1. A system for initiating ignition of a fuel-air mixture in a combustion chamber for an internal combustion engine comprising:

at least one radiation producing means for providing a beam of amplified, high-intensity, coherent radiation; said beam having an intensity to ignite said fuel-air mixture in said combustion chamber and having an intensity such that it traverses the width of said combustion chamber;

coupling means for coupling said radiation producing means to a wall of said combustion chamber and directing said beam of radiation into said combustion chamber; and,

at least one reflective surface attached to said wall of said combustion chamber for reflecting said beam of radiation within said combustion chamber.

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**4,314,531**

## PISTONS AND CYLINDER LINERS

**Ludovico Bruni, Turin, Italy, assignor to Associated Engineering Italy S.p.A., Turin, Italy**

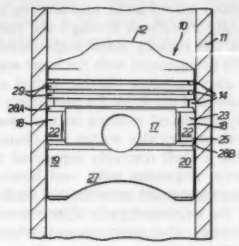
**Filed Mar. 24, 1980, Ser. No. 133,527**

**Claims priority, application United Kingdom, Nov. 13, 1979, 39294/79**

**Int. Cl.³ F02F *3/04***

**U.S. Cl. 123—193 CP** **7 Claims**

1. An internal combustion engine comprising a cylinder having an untreated cylinder wall of an aluminum alloy and a piston mainly composed of an aluminum alloy, the piston comprising a crown, a ring band integral with the crown and having grooves therein for the reception of piston rings, a skirt integral at its upper end with the ring band and having a running surface having opposed portions which form opposed thrust faces for engagement under pressure with the wall of the cylinder, and at least one expansion-control insert of ferritic steel, the insert being mounted in the skirt, a portion of the insert forming a portion of the running surface of the skirt of the piston, said portion of the insert being confined to an upper



portion of the skirt and within the opposed thrust faces of the piston.

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**4,314,532**

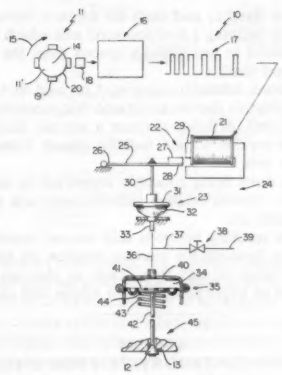
## METHOD AND APPARATUS FOR TRANSLATING FREQUENCY OF MECHANICAL MOVEMENT INTO A PNEUMATIC SIGNAL

**Frank Payne, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.**

**Filed Jun. 17, 1980, Ser. No. 160,372**

**Int. Cl.³ F02M *25/06*; F02B *71/00***

**U.S. Cl. 123—198 A** **30 Claims**



1. In combination, first means for producing mechanical movement with a certain frequency of movement, second means operatively associated with said first means for producing a pulsing electrical signal that has a pulse rate substantially proportional to said frequency of movement, and third means operatively associated with said second means for producing a pneumatic signal that has a value that is substantially proportional to said pulse rate of said pulsing electrical signal.

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**4,314,533**

## ROTARY ENGINE EMPLOYING DOUBLE ECCENTRIC

**Jose M. B. Barata, Mayor St. of Sarria No. 216, and Alejandro S. Valls, Travesera of Gracia No. 33, both of Barcelona, Spain**

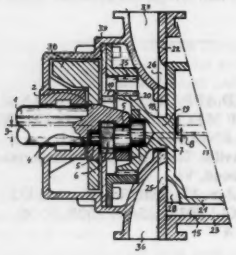
**Filed Oct. 18, 1979, Ser. No. 86,187**

**Int. Cl.³ F02B *53/00***

**U.S. Cl. 123—242** **28 Claims**

1. In a rotary-piston internal combustion engine having a housing provided with an inner cylindrical wall defined about

a housing axis and defining therein a substantially cylindrical piston-confining chamber, a piston positioned within said chamber and supported for rotation relative to said housing, said piston including a shell-like drum and a plurality of vanes which are angularly spaced about said housing axis and project radially outwardly therefrom through the periphery of said drum and have the radially outer ends thereof disposed in rotatable slidable engagement with the inner wall of said housing, the piston also including slidable swivel means coacting between the vanes and the drum for permitting the drum to be radially slidably displaced relative to the vanes so that the drum can move eccentrically within the chamber relative to said housing axis, a shaft rotatably supported relative to said housing in coaxial alignment with said housing axis, and a crank mechanism connected between said shaft and said drum for controlling the rotational path of movement of the drum within the chamber, the improvement wherein the crank mechanism comprises:



a first crank fixed to said shaft for rotation therewith, said first crank defining a first eccentric axis which is substantially parallel to and radially spaced from the rotational axis of said shaft;

a second crank rotatably supported on said first crank for rotation relative thereto about said first eccentric axis, said second crank defining thereon a second eccentric axis which is parallel to and radially spaced from said first eccentric axis;

said piston drum being rotatably supported on said second crank for rotation relative thereto about said second eccentric axis; and

gear means reacting between said second crank and said stationary housing for causing rotation of said second crank relative to said first crank so that said drum is moved in an hypocycloidal path within said chamber.

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**4,314,534**

## FEEDBACK CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

**Yasuo Nakajima, Yokosuka, and Kenji Yoneda, Fujisawa, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed May 2, 1980, Ser. No. 146,113**
**Claims priority, application Japan, May 7, 1979, 54-55394**
**Int. Cl.³ F02M** *51/00, 25/06;* **F02P** *3/02*
**U.S. Cl. 123—438** **6 Claims**

1. A control system for an internal combustion engine, comprising:

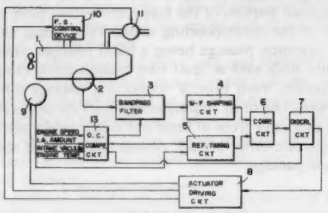
first means for issuing a signal representative of combustion pressure in a combustion chamber of said engine;

second means for issuing a signal representative of existing combustion timing of said combustion chamber by processing said signal from said first means for detection of rapid increase of the combustion pressure;

a reference timing circuit for issuing a signal representative of a predetermined reference combustion timing of said combustion chamber in accordance with operation modes of said engine;

a comparator circuit for issuing a signal representative of a difference between the signal from said second means and the signal from said reference timing circuit; and

third means for controlling at least one of engine operating parameters consisting of the ignition timing, the air-fuel



ratio of air-fuel mixture fed to said engine and the amount of exhaust gas recirculated into an intake system of said engine, by processing the signal from said comparator circuit.

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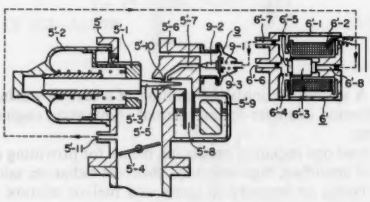
**4,314,535**

## FEEDBACK TYPE VARIABLE VENTURI CARBURETOR

**Yuzu Takeuchi, Nagoya; Shigetaka Takada, Ohbu, and Toshiharu Morino, Mie, all of Japan, assignors to Aisan Industry Co., Ltd., Aichi, Japan**

**Filed May 19, 1980, Ser. No. 150,774**
**Claims priority, application Japan, May 30, 1979, 54-66996**
**Int. Cl.³ F02B** *33/00;* **F02M** *7/00*
**U.S. Cl. 123—439** **9 Claims**



1. A feedback type variable venturi carburetor for an engine comprising

an intake manifold and a main fuel jet communicating therewith,

a variable venturi including a movable piston movably extending into said intake manifold cooperating with said main fuel jet.

means defining an air bleed passage opening into said main fuel jet,

said piston of said variable venturi constituting means for controlling a negative pressure to a substantially constant value defining a vacuum source,

an exhaust manifold communicating downstream of said engine,

an exhaust gas sensor disposed in said exhaust manifold,

control valve means for varying an amount of main air bleed through said air bleed passage and disposed at a point along said air bleed passage,

a three-way solenoid valve means operatively connected to said control valve means,

a control circuit means operatively connected to said exhaust gas sensor for controlling said three-way solenoid valve means to regulate said control valve means and the amount of the main air bleed,

said three-way solenoid valve means for performing an ON-OFF operation in accordance with a signal from said

exhaust gas sensor via said control circuit means and having a first passage communicating with said vacuum source, a second passage opening to the atmosphere, a third passage communicating with said control valve means and constituting the operative connection thereto, and a movable iron core means operatively controlled by said control circuit means for executing a valve operation, one end of said movable iron core means operatively openingly and closingly respectively cooperating with said second passage and another end of said iron core means operatively closingly and openingly respectively cooperating with said first passage, respectively, and means for biasing said iron core means to close said first passage at all times.

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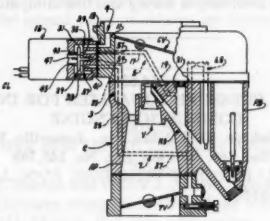
**4,314,536**

## PULSING SOLENOID IMPROVEMENT

**Larry J. Tipton, Florissant, Mo., assignor to ACF Industries, Inc., New York, N.Y.**

**Filed Dec. 31, 1979, Ser. No. 108,483**
**Int. Cl.³ F02M 7/00, 23/00**
**U.S. Cl. 123—440** **2 Claims**



1. In a control system for an internal combustion engine, the engine having a carburetor mounted thereon for producing an air-fuel mixture combusted in the engine, the carburetor having at least one air passage therethrough, a source of fuel, and high and low speed fuel circuits by which fuel is delivered from the source to the air passage to mix with air to form the mixture combusted, the system including a sensor for sensing a component of the products of combustion and for producing an electrical signal representative thereof, an electronic circuitry for processing the electrical signal to produce a control signal for controllng the air-fuel ratio of the mixture produced in the carburetor, the improvement comprising air bleed means defining a high speed air bleed path and a low speed air bleed path for respectively bleeding air into the high speed and low speed fuel circuits to vary the quantity of fuel delivered to the air passage through either fuel circuit at any one time, the air bleed means including means defining two adjacent air flow chambers in the solenoid, each chamber having an inlet and an outlet so air passing through one of said chambers is directed to the high speed fuel circuit while air passing through the other of said chambers is directed to the low speed fuel circuit; a solenoid having a movable armature and responsive to the control signal for opening and closing the air bleed means to control the quantity of air bled into the high speed and low speed fuel circuits; and, isolation means for isolating the high speed air bleed path from the low speed air bleed path to prevent cross flow of air between the paths which adversely affects the degree of control over fuel delivery through the high and low speed fuel circuits, the isolating means comprising an isolation pad attached to one end of the armature and separating the two chambers so air entering one of the chambers cannot flow into the other chamber, the outlets of each chamber being in a common wall spatially separated from each other, the wall having a cavity formed therein between the outlets and extending the length of the chambers, and the isolation pad being sufficiently large to simultaneously close both outlets when no signal is supplied to the solenoid and having an extending arm projecting into the cavity to create an isolation wall between the chambers, the depth of the cavity and the length of the arm being such that the arm remains in the cavity even when the pad is drawn away from the outlets when a signal is supplied to the solenoid whereby a physical barrier is maintained at all times between the chambers to isolate the high and low speed air bleed paths from each other.

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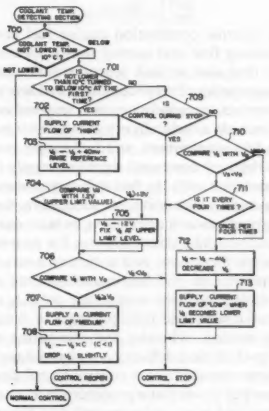
**4,314,537**

## FUEL FEEDBACK CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

**Masaharu Asano, Yokosuka; Hideyuki Tamura, Yokohama, and Shoji Furuhashi, Kami-ohokanishi, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Apr. 15, 1980, Ser. No. 140,666**
**Claims priority, application Japan, Apr. 16, 1979, 54-45326**
**Int. Cl.³ F02B 33/00; F02M 7/00; F02B 75/10; F02D 3/04**
**U.S. Cl. 123—440** **14 Claims**



1. A system for controlling, in a feedback control mode, fuel supply to an internal combustion engine so as to maintain the air-fuel ratio of an air-fuel mixture to be supplied to the engine at a preset value by correcting a fuel supply amount in response to a control signal depending upon the deviation from a reference value of an output of an exhaust-sensor for sensing the concentration of a component of engine exhaust gas,

the improvement comprising:

first means for supplying a current flow to the exhaust sensor;

second means for varying said reference value in response to the output of said exhaust sensor;

third means for controlling the initiation and stop of the feedback control in accordance with the relationship between said reference value and the output of said exhaust sensor which output is generated in response to said current flow supplied to said exhaust sensor;

fourth means for controlling the initiation and stop of the feedback control in accordance with an engine temperature;

fifth means for varying said reference value and the value of said current flow to said exhaust sensor immediately when the feedback control is stopped by said fourth means; and

sixth means for varying said reference value with the lapse of time while the feedback is stopped by said fourth means.

4,314,538

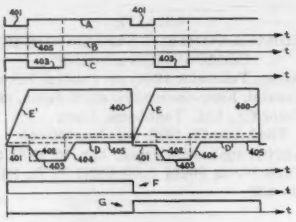
## ELECTRONIC FUEL CONTROL SYSTEM INCLUDING ELECTRONIC MEANS FOR PROVIDING A CONTINUOUS VARIABLE CORRECTION FACTOR

Junuthula N. Reddy, Troy, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 226,498, Feb. 15, 1972, which is a continuation-in-part of Ser. No. 101,896, Dec. 28, 1970, Pat. No. 3,734,068. This application Feb. 25, 1974, Ser. No. 445,411

Int. Cl.[3] F02B *3/00*

U.S. Cl. 123—485 13 Claims



1. In an internal combustion engine fuel control system of the type having first and second sensor means for producing respective first and second sensor signals indicative of the variable magnitudes of respective first and second engine operating parameters, computing means responsive to said sensor signals to provide a fuel delivery command signal indicative of the engine fuel requirement, and fuel supply means responsive to the fuel delivery command signal to supply the engine with fuel in accordance with the fuel delivery command signals, the computing means operative in successive first and second computing portions and comprising at least one timing capacitor, first and second current sources for providing respective first and second currents, and a current source switch operative to communicate said first current source with the timing capacitor during said first computing portion and said second current source with said timing capacitor during said second computing portion, whereby the computing means controls the duration of the fuel delivery command signal in accordance with the time required for a control signal developed by the timing capacitor to vary at a predetermined rate from an initial value determined in accordance with said first engine parameter during the first computing portion to a threshold value determined in accordance with said second engine parameter during the second computing portion, the computing means including an improved circuit for establishing the initial value of the control voltage by regulating the instantaneous values of the control voltage at reference levels varying with the magnitude of said first engine parameter comprising:

(a) discharge switch means having ON and OFF conditions established during said first computing portion and comprising an input electrode connected to said timing capacitor, output electrode connected to a source of constant reference potential, and control electrode, said discharge switch means operative when established in said OFF condition to permit said first constant current source to apply said first current to said timing capacitor so as to vary said control voltage in one direction and operative when established in said ON condition to communicate said timing capacitor and said source of constant reference potential so as to vary said control voltage in the opposite direction;

(b) reference level generating means responsive to the magnitude of said first engine parameter to generate a reference level output varying within a said first computing portion with the magnitude of said first engine parameter; and

(c) comparator means comprising first second and third electrodes, said first electrode connected to said timing capacitor and established at a first electrode voltage varying with said control voltage, said second electrode connected with said reference level generating means to receive said reference level output and established at a second electrode voltage varying with said reference level output, and said output electrode connected to said discharge switch control electrode, said comparator means being operative to compare said first electrode voltage and said second electrode voltage and to generate at said output electrode a third electrode voltage operative to establish said discharge switch means in one of said ON and OFF conditions only when said first electrode voltage is one of a higher and lower voltage in relation to said second electrode voltage and to establish said discharge switch means in the other of said ON and OFF conditions only when said first electrode voltage is in the other of said higher and lower voltage in relation to said second electrode voltage,

whereby said comparator means switches said discharge switch between said ON and OFF conditions to vary said control voltage in said opposite direction, said comparator means and said discharge means thereby cooperating to regulate said control voltage in accordance with said reference level output during said first computing portion.

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4,314,539

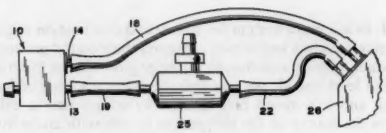
## FUEL LINE PRESSURE EQUALIZER FOR INTERNAL COMBUSTION ENGINE

Maynard W. Schade, 1238 Beloit Ave., Janesville, Wis. 53545

Filed Apr. 30, 1980, Ser. No. 145,768

Int. Cl.[3] F02D *5/02;* F02M *59/00, 37/04, 5/10*

U.S. Cl. 123—514 1 Claim



1. Pressure regulating and venting apparatus for an internal combustion engine fuel system comprising

an enclosed chamber communicated by an input passage disposed to received delivery of fuel from a fuel pump, and further communicated by a fuel outflow passage disposed to deliver fuel to a carburetor, and further communicated by a fuel return passage disposed to provide for flow of fluid to a fuel supply source, said chamber being further provided with an atmospheric vent equipped with a check valve to enable air to enter said chamber to maintain at least atmospheric pressure therein, said apparatus effecting near constant fuel pressure at said output passage.

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4,314,540

## METHOD AND APPARATUS FOR IGNITION SYSTEM SPARK TIMING CONTROL WHERE EXHAUST GAS RECIRCULATION IS USED

Kenji Ikeura, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 3, 1980, Ser. No. 136,994

Claims priority, application Japan, Apr. 23, 1979, 54-48990

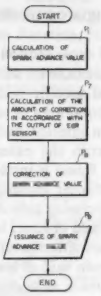
Int. Cl.[3] F02P *5/04*

U.S. Cl. 123—571 10 Claims

1. A method for the control of an ignition system spark timing for a spark ignition internal combustion engine, said method comprising the steps of:

determining value of spark advance based upon engine operating parameters of the engine;

sensing exhaust gas recirculation rate; and


START
CALCULATION OF SPARK ADVANCE VALUE
CALCULATION OF THE AMOUNT OF CORRECTION IN ACCORDANCE WITH THE OUTPUT OF EGR SENSOR
CORRECTION OF SPARK ADVANCE VALUE
ISSUANCE OF SPARK ADVANCE SIGNAL
END

correcting the value of spark advance which is determined based upon engine operating parameters in accordance with the sensed value of exhaust gas recirculation rate.

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**4,314,541**

## GRATE BAR FOR GRATE LININGS, ESPECIALLY IN FURNACES

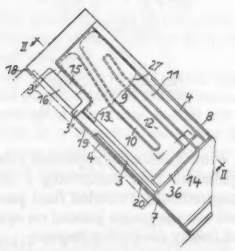
**Johannes J. Martin, and Walter J. Martin, both of Munich, Fed. Rep. of Germany, assignors to Firma Josef Martin Feuerungsbau GmbH, Munich, Fed. Rep. of Germany**

**Filed Feb. 14, 1979, Ser. No. 12,077**

**Claims priority, application Fed. Rep. of Germany, Feb. 18, 1978, 2806974**

**Int. Cl.³ F23H *11/00***

**U.S. Cl. 126—163 R** **9 Claims**




1. At least a first and second grate bar for a furnace grate lining, said second grate bar having an external rib, said first grate bar comprising:

a closed grate bar ridge;

a lateral contact surface connected to said ridge and adjoining said second grate bar;

at least one external rib downwardly extending from said ridge, a forward section only of said at least one external rib being staggered inwardly under said closed grate bar ridge and projecting inwardly toward an interior portion of said first grate bar; and

a passage chamber defined by said interior projecting portion of said at least one external rib and said external rib of said second grate bar;

said passage chamber forming a portion of a jet-like air channel and accommodating sediment passing through said air channel.

**4,314,542**

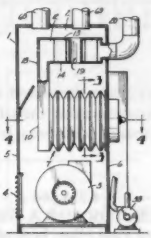
## INFRA-RED DOMESTIC FURNACE

**Rudolph S. Bratko, Hinckley, Ohio, assignor to Slyman Manufacturing Corporation, Parma, Ohio**

**Division of Ser. No. 935,500, Aug. 21, 1978, Pat. No. 4,252,520, which is a continuation of Ser. No. 687,754, May 19, 1976, which is a continuation-in-part of Ser. No. 378,335, Jul. 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 261,681, Jun. 12, 1972, abandoned. This application Sep. 16, 1980, Ser. No. 187,776**

**Int. Cl.³ F24H *3/06***

**U.S. Cl. 126—110 R** **1 Claim**



1. In a furnace comprising a main housing, a distributing plenum therein, a heat exchanger in the housing to heat air for the plenum, means to circulate air from outside the enclosure around and past the heat exchanger and to said plenum, said heat exchanger comprising an enclosure with a heat-radiating surface and a burner unit extending into the heat exchanger, the improvement wherein said unit is sealed with respect to the interior of the exchanger to provide a combustion chamber sealed from communication with the plenum and ambient air, and said burner unit is constructed of a hollow fibrous porous matrix having a closed end and an open end, the closed end being located within the heat exchanger, and further comprises means, including a plate, closing the open end of the matrix, an inlet for a combustible gas-air mixture extending through the plate into the open end of the matrix, structure defining an air chamber adjacent said plate and matrix and having peripheral outlet means adjacent the open end of the matrix, said matrix having a peripheral marginal portion near its open end exposed to air flowing from said chamber through said outlet means, and means to supply a pre-mixed air-gas mixture under pressure greater than atmospheric pressure, including air from a source remote from the heat exchanger, to the burner unit to produce infra-red radiation, said matrix being an alumina silica composition including chromic oxide, said matrix including a flange at the open end of the same composition as the matrix, the flange being saturated with a sealing material comprising a colloidal silicate that inhibits penetration of the air-gas mixture.

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**4,314,543**

## STOVE SAFETY GUARD

**John G. Bullington, Rte. 1, Old Madison Rd., Madison Heights, Va. 24572, and Lemmie D. Tate, Rte. 2, Box 274, Amherst, Va. 24521**

**Filed Jul. 3, 1980, Ser. No. 165,803**

**Int. Cl.³ F24C *15/36***

**U.S. Cl. 126—201** **2 Claims**

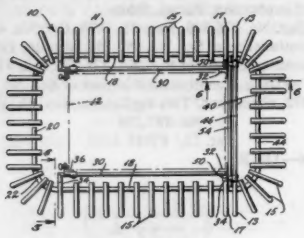
1. A safety guard for a free-standing stove comprising:

a multiplicity of generally vertical bowed hollow tubes open top and bottom disposed in a closed array adapted to surround at least the front and sides of a stove;

upper and lower horizontal support bars adjacent the tube ends, said horizontal bars being spaced substantially inward of the periphery of the safety guard as a whole by the bowed structure of the tubes, said vertical tubes being secured to said horizontal support bars;

a hinged section of the tube array adapted to pivot free of the

face of the stove providing thereby access to the face of the stove; and,



clamping brackets inside the closed array of tubes and attached to said array securing the safety guard to the stove with the tubes spaced well away from the stove.

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**4,314,544**

## SOLAR COLLECTOR FOR A WINDOW FRAME

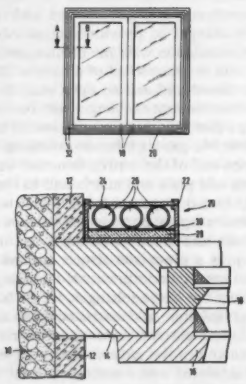
**Gottfried Müller, and Paul Hipp, both of Kolbingen, Fed. Rep. of Germany, assignors to Schako-Metallwarenfabrik Ferdinand Schad GmbH, Fed. Rep. of Germany**

**Filed May 8, 1979, Ser. No. 37,023**

**Claims priority, application Fed. Rep. of Germany, May 13, 1978, 2821165**

**Int. Cl.³ F24J 3/02**

**U.S. Cl. 126—417** **6 Claims**



1. A solar collector for a window frame having a pane for installation on a building or the like comprising, in combination:

a window frame having a substantially flat exterior surface of a specific width,

a channel of U-shaped cross section having a base mounted on said window frame exterior surface having a width less than or equal to said specific width and extending along the majority of the total area of said flat exterior surface,

said channel having an interior and an outwardly opening side facing away from the exterior of the building in which said window frame is installed,

a cover transparent to solar radiation disposed within said channel outwardly opening side and

at least one conduit in said channel interior for conducting a heat transfer medium therethrough for heating by said solar radiation wherein said at least one conduit is in the form of a plurality of tubes and including a thermally insulating cladding disposed on said base of said channel within said channel interior.

3. A solar collector for a window frame having a pane for installation on a building or the like comprising, in combination:

a window frame having a substantially flat exterior surface of a specific width,

a channel of U-shaped cross section having a base mounted on said window frame exterior surface having a width less than or equal to said specific width and extending along the majority of the total area of said flat exterior surface,

said channel having an interior and an outwardly opening side facing away from the exterior of the building in which said window frame is installed,

a cover transparent to solar radiation disposed within said channel outwardly opening side and

at least one conduit in said channel interior for conducting a heat transfer medium therethrough for heating by said solar radiation wherein said at least one conduit is in the form of a passage which meanders in the interior of said channel and including a thermally insulating cladding disposed on said base of said channel within said channel interior.

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**4,314,545**

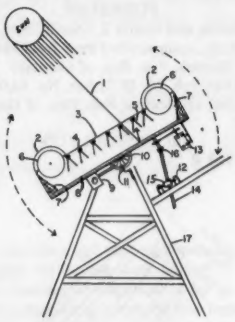
## SOLAR HOT WATER GENERATOR

**Charles W. Bowman, 1445 Bristol Pike, Morrisville, Pa. 19067**

**Filed May 9, 1979, Ser. No. 36,820**

**Int. Cl.³ F24J 3/02**

**U.S. Cl. 126—424** **9 Claims**



1. A solar hot water generating apparatus comprising:

a hot water generator core comprising a heat exchanger defining a longitudinally extended fluid passageway, and including fluid storage means located on opposite sides of said core and fluidly connected thereto;

support means for said generator core to permit said generator core to pivot in a vertical plane;

means for pivoting said generator core in response to the change of direction of the sun, said pivoting means comprising actuating means mechanically connected to said generator core to cause the pivoting movement thereof, and automatic switching means associated with said actuating means, said switching means adapted to control the operation of said actuating means in response to the movement of the sun;

hot water storage means fluidly connected to the generator core and removed therefrom, said hot water storage means having an inner fluid container thermally insulated from external ambient atmospheric conditions; and,

a fluid conduit means connecting said generator core to said storage means, and to a water supply, said fluid conduit means including a plurality of reversible check valves provided adjacent said generator core, to reverse the flow of hot water through said generator core as said core

changes its position in response to the movement of the sun.

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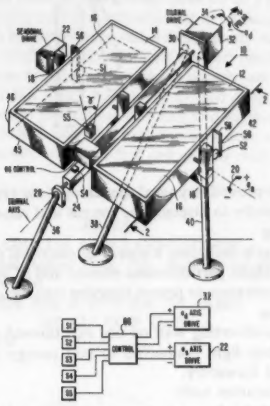
**4,314,546**
**ARRAY POSITIONING SYSTEM**
**Arthur Miller, Princeton Junction, N.J., assignor to RCA Corporation, New York, N.Y.**
**Filed Jan. 21, 1980, Ser. No. 113,506**
**Int. Cl.³ F24J *3/02*; G01J *1/20*; G03B *21/00***
**U.S. Cl. 126—425** **14 Claims**



1. A tracking system for a solar array which is tiltable about a diurnal axis comprising:

light sensor means responsive to incident solar energy for producing an output signal manifestation indicative of the difference in orientation between the sun orientation and a reference sun orientation and the difference in orientation between the array orientation and a reference array orientation,

attitude sensor means coupled to said array for producing an output indicative of the direction of tilt of said array about said diurnal axis, and

control means responsive to said output signal manifestation and to said output signal of said attitude sensor means for slewing said array about said diurnal axis toward its tracking position in a direction such that the array rotates within a given angle, less than 360°, between fixed limits regardless of the initial sun and array orientations.

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**4,314,547**
**SOLAR HOT WATER SYSTEM WITH SUB-LOOP HYDRONIC HEATING**
**Justin E. Walsh, 16 Thayer Pl., Brookline, Mass. 02146**
**Filed Feb. 4, 1980, Ser. No. 117,833**
**Int. Cl.³ F24J *3/02***
**U.S. Cl. 126—428** **1 Claim**

1. A heating system for a building comprising in combination

(a) at least one radiator located within said building,

(b) at least one solar heating panel mounted in position for heating a first liquid,

(c) first conduit means connected between said panel and said radiator,

(d) first circulator means operatively connected to said first conduit means for circulating said first liquid through said panel and said radiator,

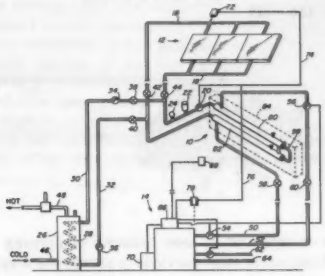
(e) a furnace operatively associated with said building for heating a second liquid,

(f) second conduit means connected between said furnace and said radiator,

(g) second circulator means operatively connected to said second conduit means for circulating said second liquid through said furnace and said radiator,

(h) said radiator providing separate flow paths for said first and second liquids in heat exchanging relation to one another,

(i) said radiator including a tubular outer conduit connected to one of said first and second conduits and a tubular inner conduit extending coaxially through said outer conduit to



define an annular passage therewith and connected to the other of said first and second conduits,

(j) said inner and outer conduits being formed into generally parallel U-shaped loops, and,

(k) a first cross-coupling connected between the ends of said outer conduit to provide a flow path therebetween and a second cross coupling located exterior to said first cross-coupling and connected between the ends of said inner conduit to provide a flow path therebetween.

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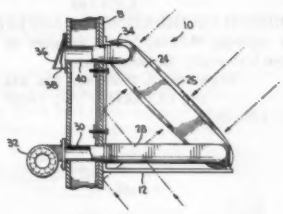
**4,314,548**
**SOLAR COLLECTOR**
**David J. Hanson, New Castle, Me. 04553**
**Filed Jun. 3, 1980, Ser. No. 155,955**
**Int. Cl.³ F24J *3/02***
**U.S. Cl. 126—429** **2 Claims**



1. A pressurized and inflatable solar energy collector comprising a radiating heat absorbing panel assembly formed of a central panel of a plurality of longitudinally disposed air passageways and end frames integral with said central panel formed perpendicular to said central panel, first and second manifold sections in fluid communication with said air passageways, end cap sections adapted to fit over said first and second manifold sections and said end frames, at least one of said end cap sections including an air inlet and air outlet port, an air inlet duct connected to said air inlet port in fluid communication with said first manifold section, an air exhaust duct connected to said air outlet port in fluid communication with said second manifold section, an inflatable air-tight bag forming the outer layer of said collector and a source of pressurized air connected to said air inlet duct for inflating said bag and pressurizing said assembly and providing air flow between said air

inlet ducts, said first manifold section, said air passageways, said second manifold section, and said outlet duct.

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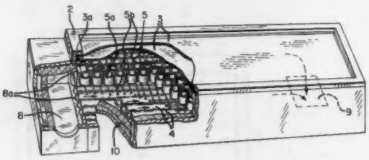
**4,314,549**
**OMNIDIRECTIONAL SOLAR COLLECTOR**
**William A. Swanson, 2485 S. W. Elmhurst, Beaverton, Oreg. 97005**
**Filed May 25, 1979, Ser. No. 42,703**
**Int. Cl.³ F24J *3/02***
**U.S. Cl. 126—449** **5 Claims**



1. An omnidirectional solar collector comprising
(a) a transparent sheet pervious to shortwave solar radiation but impervious to longwave radiation,
(b) a primary collector comprising a plurality of parallel tubes, including a means on the surface for absorbing shortwave solar radiation and re-radiating the same as longwave radiation, and
(c) a secondary collector comprising a layer of cells situated between said transparent sheet and said primary collector with respective air spaces on either side of said layer of cells, a first one of said air spaces separating said cell layer from said primary collector, cell walls in said cell layer being oriented generally perpendicular to the surface of said primary collector and being open to both sides of said layer so that the interior of each cell is exposed to both of said first and second air spaces, said cell walls including means absorbing shortwave solar radiation and re-radiating the same as longwave radiation.

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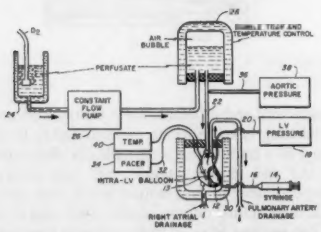
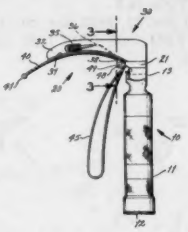
**4,314,550**
**METHOD OF TREATING AN ARRESTED HEART**
**Carl S. Apstein, Waban, Mass., assignor to The Trustees of Boston University, Boston, Mass.**
**Filed May 1, 1980, Ser. No. 145,544**
**Int. Cl.³ A61B *17/00, 19/00***
**U.S. Cl. 128—1 D** **25 Claims**




1. A method of treating a heart during a period of arrest to protect the heart from the deleterious effects of sustained inactivity, the method comprising applying expanding force to the heart and expanding the ventricular volume a significant amount during the period of arrest to a volume greater than the arrested ventricular volume, the expansion causing stretching of the heart muscles.

**4,314,551**
**LARYNGOSCOPE**
**Roger J. Kadell, 508 N. Hunter, Lebanon, Ill. 62254**
**Filed Mar. 6, 1980, Ser. No. 127,925**
**Int. Cl.³ A61B *17/24***
**U.S. Cl. 128—11** **1 Claim**



1. An improved laryngeal speculum of the type inserted into the oral cavity to displace the tongue and raise the epiglottis, comprising
a hand grip including a source of electrical energy,
a fixed blade part mounted thereto and of sufficient length and curvature to permit insertion into the oral cavity, and having
a tongue-diverting wall on one side thereof, and
an electric light connected to said energy source and directed forwardly,
in combination with
a movable blade part at the side of the fixed blade part which is opposite to the tongue-diverting wall, said movable blade part having
a pivot mounting adjacent to the hand grip and an operating lever projecting alongside said hand grip,
said movable blade part being formed to follow the curvature of said fixed blade part and extend therebeyond to terminate in a rounded tip,
whereby on inserting the rounded tip adjacent to the base of the tongue and squeezing the operating lever against the hand grip, the base of the tongue is raised without raising the laryngoscope or bringing it against the upper teeth and without affecting the direction of the light means.

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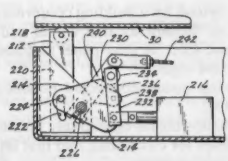
**4,314,552**
**CHIROPRACTIC TABLE**
**Derryl E. Moon, Fairmount, N. Dak. 58030**
**Continuation-in-part of Ser. No. 927,961, Jul. 26, 1978, Pat. No. 4,230,100. This application Jun. 16, 1980, Ser. No. 159,875**
**Claims priority, application Canada, Jul. 26, 1978, 331839**
**The portion of the term of this patent subsequent to Oct. 28, 1997, has been disclaimed.**
**Int. Cl.³ A61F *5/00***
**U.S. Cl. 128—70** **2 Claims**



1. A body support assembly for a chiropractic table having a frame comprising:
a support box having opposite ends;

mounting means for pivotally mounting said support box to said frame for pivotal movement about a horizontal axis;
lock means for selectively locking said support box in any of a plurality of pivotal positions about said horizontal axis;
a support piece positioned above said support box and having opposite ends;
a first and second cock and drop assemblies, each supporting said support piece at one of said opposite ends,
said first and second cock and drop assemblies each being movably mounted to said support box for movement from a cocked position supporting one of said opposite ends of said support piece in an elevated position to a drop position supporting said one opposite end in a lower position;
power means for selectively and independently raising said cock and drop assemblies to their cocked positions, said power means being deactuatable to permit said cock and drop assemblies to fall by gravity to their drop positions,
connecting means movably connecting said support piece to said support box whereby said opposite ends are free to move vertically with said first and second cock and drop assemblies.

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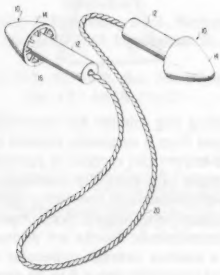
**4,314,553**
**EARPLUG AND EARPLUG SET**
**Roland Westerdal, Great Falls, Va., assignor to Bilsom AB, Billesholm, Sweden**
**Filed Aug. 8, 1979, Ser. No. 64,861**
**Int. Cl.³ A61F *11/02***
**U.S. Cl. 128—152** **17 Claims**



1. An earplug adapted in size to fit within and to be inserted into a wide range of human ear canals comprising:
(a) a stem portion;
(b) a front portion mounted on said stem portion, said front portion being a conically shaped flexible wall member having a convex outer surface and a concave inner surface, said stem portion extending within said wall member and connected to the inner surface, and disposed such that a space exists between the inner surface of said front portion and said stem portion both prior to and during insertion of said earplug canal; and
(c) means comprising a plurality of spacing members extending between said inner surface of said front portion and said stem portion for spacing the inner surface of the front portion from said stem portion both prior to and during insertion of said ear plug into an ear canal.

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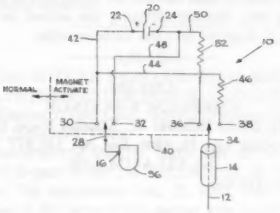
**4,314,554**
**TISSUE GROWTH CONTROL APPARATUS AND METHOD**
**Wilson Greatbatch, 5220 Donnington Rd., Clarence, N.Y. 14031**
**Filed Jul. 16, 1979, Ser. No. 57,744**
**Int. Cl.³ A61N *1/30, 1/32***
**U.S. Cl. 128—207.21** **17 Claims**

1. Apparatus for implantation in a patient for providing germicidal and healing treatment of tissue such as bone comprising:
(a) an electrode of silver adapted to be operatively connected to a living tissue site to be healed;
(b) another electrode adapted to be connected to a location spaced from the site to be healed;
(c) a source of direct voltage having positive and negative polarity output terminals;
(d) switching means operatively connected to said electrodes and to said terminals of said source, said switching means having a first state wherein said silver electrode is connected to said positive terminal and said other electrode is connected to said negative terminal once during an initial portion of the time during which said silver electrode is operatively connected to the tissue site and a second state wherein said silver electrode is connected to said negative terminal and said other electrode is connected to said positive terminal once during the remaining portion of the time during which said silver electrode is




operatively connected to the tissue site, said switching means including means enabling said switching means to be operated by operator means positioned external to said patient at a location so as to be operatively associated with said switching means for selectively and non-invasively changing the states of said switching means; and
(e) means for enclosing said source, said switching means, any portion of said silver electrode not in operative contact with said tissue site to be healed, and any portion of said other electrode not in operative contact with said location spaced from the site to be healed, said enclosing means being of human body reaction free material thereby permitting said apparatus to be implanted in the body of the patient;
(f) whereby when said switching means is in said first state current flow is in a direction relative to said silver electrode causing silver ions to be released to create a germicidal environment at the tissue site and when said switching means is in said second state current flow is in an opposite direction causing healing of tissue at the site.

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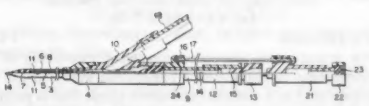
**4,314,555**
**INTRAVASCULAR CATHETER ASSEMBLY**
**Kyuta Sagae, Tokyo, Japan, assignor to Terumo Corporation, Tokyo, Japan**
**Filed Feb. 4, 1980, Ser. No. 118,310**
**Claims priority, application Japan, Feb. 20, 1979, 54-20424[U]**
**Int. Cl.³ A61M *5/00***
**U.S. Cl. 128—214.4** **11 Claims**



1. An intravascular catheter assembly which comprises:
a catheter hub;

a flexible catheter tube which is provided with an axially extending hole, and whose proximal end is fixed to said catheter hub;

a cannula which is detachably inserted into the axially extending hole, with the distal end of said cannula arranged to protrude from the distal end of the flexible catheter tube and the proximal end of said cannula being provided with a tubular hub;

a rigid connector which is fitted to the proximal end of the catheter hub with a flexible tube interposed between said connector and the catheter hub;

a seal cap which is fitted around the connector, the an axially extending hole, and whose inner wall tightly abuts against the outer wall of the cannula when the cannula passes through said axially extending hole;

a cannula-locating bar, one end of which is fixed to the peripheral surface of a tubular hub of the cannula, and the other end of which projects toward the proximal end of the catheter hub; and

a stopper which is mounted on the peripheral surface of the catheter hub to abut against the distal end of the cannula-locating bar, thereby defining the extent to which the cannula is inserted into the catheter tube.

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**4,314,556**

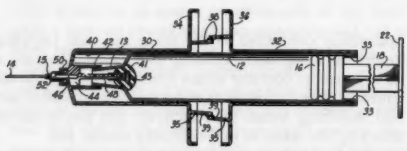
**EMERGENCY SYRINGE**

**Austin C. Ma, 23812 Helsinki St., Mission Viejo, Calif. 92691**

**Filed Apr. 21, 1980, Ser. No. 141,877**

**Int. Cl.³ A61M *5/00***

**U.S. Cl. 128—218 DA** **11 Claims**



1. In a hypodermic syringe of the type having a containment chamber for long term sealed storage of a liquid therein and having means for dispensing the stored liquid through a channeled needle after the containment chamber is unsealed, the combination comprising:

a constricted opening in said chamber forming a fluid path therein, said fluid path being in substantial proximity to said dispensing means,

a stopper inside said chamber in blocking engagement with said fluid path,

means for pushing said stopper further into said chamber without increasing the pressure in said chamber and for holding said stopper in fixed displacement from said fluid path thereby unsealing said chamber, and

means for forcing said liquid through said fluid path and in to said dispensing means.

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**4,314,557**

**DISSOLUTION CONTROLLED ACTIVE AGENT DISPENSER**

**Santosh K. Chandrasekaran, Palo Alto, Calif., assignor to ALZA Corporation, Palo Alto, Calif.**

**Filed May 19, 1980, Ser. No. 150,966**

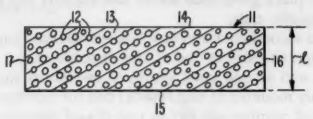
**Int. Cl.³ A61M *7/00***

**U.S. Cl. 128—260** **7 Claims**

1. An active agent dispenser consisting essentially of a flat body consisting essentially of a particulate active agent solute phase dispersed in a continuous matrix phase that is permeable to the active agent solute phase wherein the following conditions are met

(a) $D >> K$ where D is the diffusion coefficient of the active agent solute phase in the matrix phase in $cm^2/sec$ and K is the dissolution rate constant of the active agent solute phase in the matrix phase in cm/sec and

(b) Kl/D is less than about 0.06 where K and D are as defined previously and l is the thickness of said body in cm



whereby the rate at which active agent is dispensed is (i) controlled by the rate at which the active agent solute phase dissolves in the matrix phase, and (ii) substantially constant.

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**4,314,558**

**SURGICAL DRAINAGE BAGS**

**Ralf Korpman, Bridgewater, N.J., assignor to Permacel, New Brunswick, N.J.**

**Filed Apr. 28, 1980, Ser. No. 144,497**

**Int. Cl.³ A61F *5/44***

**U.S. Cl. 128—283** **6 Claims**

1. A self-sealing bag suitable for receiving body fluids and waste discharged from a surgically created orifice comprising a flexible, fluid-impervious receptacle provided with an opening, said bag made of a normally non-tacky, non-elastic film prepared from a composition consisting essentially of a blend of (a) a thermoplastic-elastomeric block copolymer component wherein the thermoplastic blocks are derived from alkenylarenes, possess a number average molecular weight of at least about 5,000, and constitute about 5 to 50 percent by weight of the block copolymer, and the elastomeric blocks are derived from conjugated dienes or lower alkenes, and possess a number average molecular weight of at least about 45,000, and (b) a resin component wherein the resin is one tending to associate with the thermoplastic alkenylarene blocks of the thermoplastic-elastomeric block copolymers and is employed in an amount of from about 30 to 130 parts per 100 parts by weight of the block copolymer, said film characterized by having the property of deforming on the application of a stretching force and changing from a non-tacky, plastic, inelastic material to a tacky, elastic material; and said film providing a sealing means to the opening of the bag when stretched at least 100 percent in the vicinity of the opening in a direction perpendicular to the opening, then relaxed and the sides of the opening pressed together.

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**4,314,559**

**NONSTICK CONDUCTIVE COATING**

**Richard E. Allen, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.**

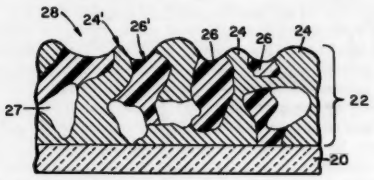
**Filed Dec. 12, 1979, Ser. No. 102,886**

**Int. Cl.³ A61B *17/36***

**U.S. Cl. 128—303.14** **14 Claims**

1. In an electrosurgical cutting blade having deposited thereon electrodes for contacting tissue and carrying electrical source generated hemostatic and cauterizing currents thereto,

each electrode comprising an electrically conductive non-stick composite coating deposited near the cutting edge thereof including: a first coating of electrically conductive material adherently deposited on said blade near the cutting edge, said first coating having an exposed textured surface; a second coating of nonstick material adherently deposited on said blade at least over said first coating to the extent that the textured




surface of said first coating, in the form of a sufficiently roughened mass having interconnected intersticies forming locations for the secure adhesion of the non-stick material therein, is at least partially filled therewith, portions of said first coating in the form of interconnected islands being exposed and conductive, and the second coating imparting non-stick characteristics to the blade.

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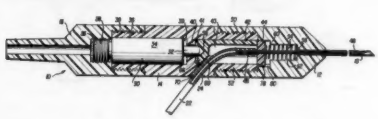
**4,314,560**

## POWERED HANDPIECE FOR ENDOPHTHALMIC SURGERY

**Maxwell A. Helfgott, 5640 Bradley Blvd., Bethesda, Md. 20014, and Gerald N. Helfgott, 5513 Uppingham St., Chevy Chase, Md. 20015**

**Filed Nov. 28, 1979, Ser. No. 97,984**
**Int. Cl.³ A61B *17/32***
**U.S. Cl. 128—305** **5 Claims**



1. A powered handpiece for endophthalmic surgery comprising:

(a) a projecting tubular surgical instrument including coaxial inner and outer tubular members, said inner tubular member being slidably received within said outer tubular member for linear reciprocation therein;

(b) a platform member rigidly attached to said inner tubular member near the proximal end thereof such that the proximal end of said inner tubular member extends beyond said platform member by a distance sufficient to permit the connection of a flexible tube to the proximal end of said inner tubular member;

(c) a pneumatic linear actuator for producing linear reciprocating motion from a pneumatic power source;

(d) a coupling member interposed between said pneumatic linear actuator and said platform member for transmitting linear reciprocating motion from said pneumatic actuator to the inner tubular member of said projecting tubular surgical instrument, one end of said coupling member being contoured for abutting said platform member in order to transmit linear reciprocating motion thereto while providing clearance for the connection of a flexible tube to the proximal end of said inner tubular member which extends beyond the platform member for carrying out suction or infusion through said inner tubular member during linear reciprocation thereof, said coupling member being maintained in simple abutting contact with the platform member without rigid mechanical connection thereto;

(e) a return spring operatively associated with the inner tubular member of said projecting tubular surgical instrument for acting in opposition to the motion produced by said pneumatic linear actuator as transmitted to said inner tubular member by said coupling member; and

(f) a housing for receiving said return spring, said coupling member, said pneumatic linear actuator, said platform member, and the proximal portion of said projecting tubular surgical instrument, said housing comprising:

(1) an anterior section for receiving the return spring, the platform member and the proximal portion of said projecting tubular surgical instrument;

(2) a posterior section for receiving in tandem arrangement said pneumatic linear actuator and said coupling member; and

(3) means for releasably coupling the anterior and posterior sections of said housing so as to bring said one end of the coupling member into abutting contact with the platform member.

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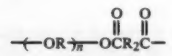
**4,314,561**

## SURGICAL SUTURE DERIVED FROM SEGMENTED POLYETHER-ESTER BLOCK COPOLYMERS

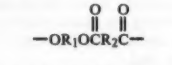
**Donald S. Kaplan, Irvine, Calif., assignor to American Cyanamid Company, Stamford, Conn.**

**Continuation-in-part of Ser. No. 7,076, Jan. 29, 1979, which is a continuation-in-part of Ser. No. 933,224, Aug. 14, 1978, Pat. No. 4,224,946. This application Aug. 25, 1980, Ser. No. 181,286**
**The portion of the term of this patent subsequent to Jan. 27, 1998, has been disclaimed.**
**Int. Cl.³ A61L *17/00***
**U.S. Cl. 128—335.5** **4 Claims**

1. An annealed non-absorbable monofilament sterile surgical suture or ligature comprising a polymeric block (A) consisting of a polyalkylene ether of the formula



having a number average molecular weight of from about 500–3000 wherein R is a straight chain alkyl group of about 4 carbon atoms and $R_2$ is 1,4-phenylene and n is the number of repeating units; and a polymeric block (B) which is the reaction product of an aromatic dicarboxylic acid and a short chain aliphatic diol, having the formula



wherein $R_1$ is a straight chain alkyl group of about 4 carbon atoms and $R_2$ is 1,4-phenylene, said block (B) comprising about 82% of the copolymer, and said copolymer having a number average molecular weight of from about 25,000 to 30,000, such that said suture has good flexibility, good fatigue life and high tensile strength.

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**4,314,562**

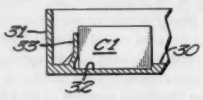
## ENCLOSURE SYSTEM FOR BODY IMPLANTABLE ELECTRICAL SYSTEMS

**Lyle A. Ware, Bloomington, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.**

**Continuation-in-part of Ser. No. 7,307, Jan. 29, 1979, Pat. No. 4,243,042, which is a continuation of Ser. No. 793,638, May 4, 1977, abandoned. This application Jan. 23, 1980, Ser. No. 114,714**
**Int. Cl.³ A61N *1/00***
**U.S. Cl. 128—419 P** **24 Claims**

1. In a body implantable stimulator of the type having inter-

connected components housed within a preformed enclosure, the improvement which comprises insulating and isolating cup means formed of a resilient, non-conductive material and con-




figured to accept said components and substantially fill said enclosure, said cup means further comprising resilient means engaging at least one component for maintaining said component in a preselected position within said cup means.

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**4,314,563**

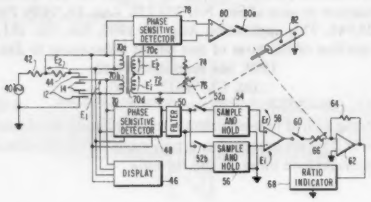
## APPARATUS FOR MEASURING RELATIVE CHANGES IN BLOOD VOLUME IN A PORTION OF AN ANIMAL BODY TO DETECT A VENOUS OCCLUSION

**Hewitt B. Wheeler, Dedham, Mass., assignor to The United States of America as represented by the Administrator of the Veterans Administration, Washington, D.C.**

**Continuation of Ser. No. 75,227, Sep. 24, 1970, abandoned. This application Jun. 21, 1973, Ser. No. 372,092**

**Int. Cl.³ A61B *5/00***

**U.S. Cl. 128—693** **5 Claims**




1. Apparatus for measuring relative changes in blood volume in a portion of an animal body, comprising:

A. means for measuring the impedance through said body portion;

B. means for registering a first value of said impedance when the animal body is in a first reference condition in which a temporary, forced blockage of the venous return to the heart is applied,

c. means for registering a second value of said impedance when the animal body is in a second reference condition free of said temporary forced blockage,

D. means for forming an index relating the difference between said first and second impedance values to a selected reference value, and

E. means for providing an output indicative of the magnitude of said index.

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**4,314,564**

## METHOD AND APPARATUS FOR DETERMINING ALCOHOL CONCENTRATION IN THE BLOOD

**Scato Albarda, Gross Schenkenberg, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany**

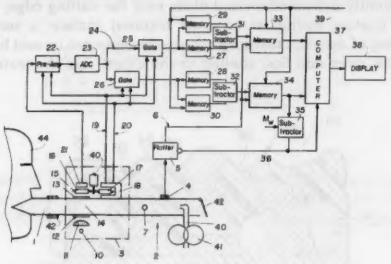
**Filed Jan. 15, 1980, Ser. No. 112,231**

**Claims priority, application Fed. Rep. of Germany, Feb. 22, 1979, 2906790**

**Int. Cl.³ A61B *5/00***

**U.S. Cl. 128—719** **13 Claims**

1. A method of determining the alcohol concentration in the blood of a person by testing a person's breath, comprising, maintaining at least a minimum flow rate for the person's breath, measuring the alcohol amount in the test sample, measuring an increase in humidity in the test sample over an ambient humidity in the air, and determining the ratio between the alcohol amount and the increase in humidity to obtain a value




which is proportional to the alcohol concentration in the blood of the person.

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**4,314,565**

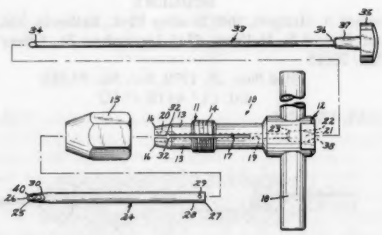
## BIOPSY AND ASPIRATION NEEDLE UNIT

**Peter F. Lee, 6425 Vernon Ave., Edina, Minn. 55436**

**Continuation-in-part of Ser. No. 883,263, Mar. 3, 1978, abandoned, which is a continuation of Ser. No. 706,130, Jul. 16, 1976, abandoned. This application Oct. 26, 1979, Ser. No. 88,818**

**Int. Cl.³ A61B *10/00***

**U.S. Cl. 128—753** **5 Claims**



1. A bone marrow biopsy needle unit comprising:

(a) holding means including a collet chuck and a head portion aligned coaxially so that a line running along the common axis defines a longitudinal axis of said holding means, a bore of circular cross section along said longitudinal axis through said head portion and said collet chuck, and handle means extending from said head portion generally at right angles to said longitudinal axis, said collet chuck comprising a plurality of arms with external threading thereon, adjacent arms being separated by said generally longitudinally extending slot, each arm terminating in a jaw portion, and a collar nut to threadedly engage and radially compress said arms, each arm having an interior surface, said interior surfaces defining a segmented cylinder generally of a first diameter when said arms are not compressed by said collar nut;

(b) a replaceable cannula, of predetermined length and gauge, of uniform hollow cylindrical configuration throughout the major portion of its length, having an open distal end, an external distal end surface portion uniformly tapered toward said distal end and an internal distal end surface portion tapered uniformly from a first circular diameter which extends along the major portion of said length of said cannula to a smaller circular diameter at said distal end, said distal end defining a cutting edge which is outwardly beveled and is obliquely disposed to the longitudinal axis of said cannula, an open proximal end, and an external proximal end surface portion, said proximal end

having a second diameter generally equal to said first diameter and being adapted to be releasably mounted in said collet chuck with a bore thereof being coaxially aligned with said bore of said holding means;

(c) interlocking means for preventing movement of said cannula along or around said longitudinal axis of said holding means when said proximal end of said cannula is mounted in said collet chuck, said interlocking means comprising a protrusion and a recess, said protrusion extending from said proximal end portion of said cannula in a direction generally radial from said longitudinal axis a distance beyond said first diameter into one of said slots, said protrusion having an abutment surface facing in a direction of rotation about said longitudinal axis, said recess extending into at least one of said arms from an edge of said last-mentioned arm defining one of said slots into said last-mentioned arm in a direction of rotation about said longitudinal axis to define an abutment edge facing in a direction of rotation about said longitudinal axis, said abutment surface and abutment edge mating when said cannula is connected to said chuck to prevent the rotation of said cannula with respect to said chuck;

(d) an elongated stylet, of predetermined length and gauge, of generally uniform circular cross section mounted in said aligned bores, said stylet having a distal end, a proximal end, and a cap portion at said proximal end; and

(e) engaging means on both said stylet and said head portion cooperating to releasably engage said stylet and said holding means.

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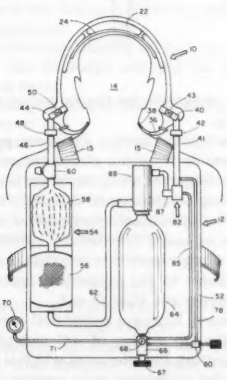
**4,314,566**

## AIR COOLER FOR SELF-CONTAINED BREATHING SYSTEM

**Robert S. Kiwak, Northville, Mich., assignor to The Bendix Corporation, Southfield, Mich.**

**Filed Aug. 28, 1980, Ser. No. 182,204**
**Int. Cl.³ A62B** *7/00*
**U.S. Cl. 128—204.15** **5 Claims**



**1.** In a breathing apparatus having means for scrubbing carbon dioxide from a stream of gas exhaled by a user to provide a stream of recycled gas, a tank of compressed breathable gas and means for reducing the pressure of said compressed breathable gas and adding the reduced pressure gas to the stream of recycled gas for use by said user, a heat exchanger for cooling said stream of recycled gas comprising:

a heat sink located inside said tank;

a heat exchange element located outside said tank in said stream of recycled gas; and

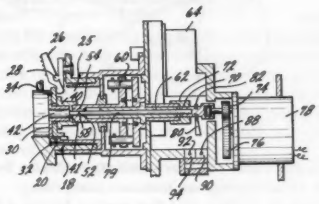
a heat pipe connecting said heat sink and said heat exchanger element.

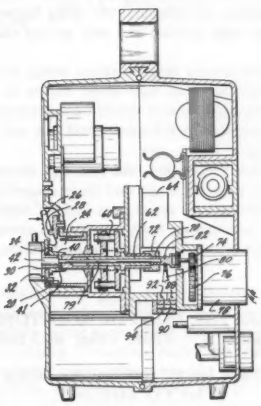
**4,314,567**

## DROP CONTROLLER

**Raymond E. Cannon, San Diego, Calif., assignor to IMED Corporation, San Diego, Calif.**

**Filed Sep. 24, 1979, Ser. No. 78,573**
**Int. Cl.³ A61M** *5/00*
**U.S. Cl. 128—214 F** **34 Claims**





**1.** In combination in a drop controller for use with a cassette having a detent to hold the cassette in fixed but removable relationship to the drop controller,

a housing,

a plurality of detent means extending from the housing and having springlike characteristics for releasably holding the detent means on the cassette and having a looped configuration defining a socket for insertion of the cassette into the socket,

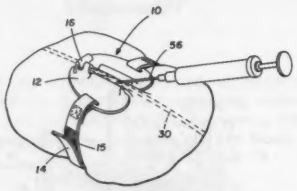
pin means supported by the housing, and

lever means mounted on the pin means and having a first arm and a second arm longer than the first arm and having first and second pivotable dispositions, the second arm being disposed for engagement by the cassette, upon the movement of the cassette into the socket, to become pivoted to the first position and being disposed in the first position in the housing in engagement with the cassette, the first arm being disposed externally of the housing for manual operation for removing the cassette from the socket.

## 4,314,568
## VASCULAR STABILIZER

James A. Loving, Dallas, Tex., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jan. 11, 1980, Ser. No. 111,355
Int. Cl.[3] A61B *17/12;* A61M *5/00*
U.S. Cl. 128—327 12 Claims

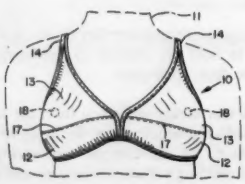



1. An adjustable vascular stabilization device for stabilizing a blood vessel during venipuncture comprising:
- a first body portion, said first portion having a first stabilizing edge portion thereon;
- a second body portion, said second body portion having a second stabilizing edge portion thereon;
- hinge means connecting said first and second body portions;
- means securing said first body portion and said second body portion in contact with a patient with the portion of the vessel subject to venipuncture lying between said first stabilizing edge portion and said second stabilizing edge portion;
- said first and second body portions being pivotal from an initial position about said hinge means to a stabilizing position to stabilize said vessel during venipuncture, said vessel being stabilized between said first and second stabilizing edge portions; and
- locking means preventing said first and second body portions from pivoting about said hinge means from the position stabilizing said vessel, said locking means permitting said first and second body portions to pivot freely from the initial position to the stabilizing position.

## 4,314,569
## BRA FOR ATHLETIC ACTIVITIES

Joanne E. Speno, 1977 Reliez Valley Rd., Lafayette, Calif. 94549

Filed Jul. 25, 1979, Ser. No. 60,828
Int. Cl.[3] A41C *3/00*
U.S. Cl. 128—425 9 Claims

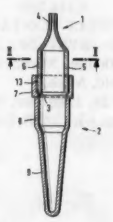



1. A bra for athletic activities, comprising:
- an under cup at each breast, extending from the bottom edge of the bra up to a line below the nipple position;
- a side panel at the outer end of each under cup, extending generally the same height as the under cup, for supporting the outer sides of the breasts;
- a top cup at each breast, above the under cup and connected to the under cup in a seam at said line, the top cup extending laterally above the side panel in continuous manner, to help distribute the tops of the breasts comfortably and naturally;
- a back strap extending from the outside ends of the side panels and top cups, for retaining the bra to the breasts; and
- a pair of shoulder straps, each extending from the top of a top cup to a connection with the back strip, for supporting the bra on the shoulders;
- the bra having the raw edges of all seams protected from contact with the wearer's skin, for avoidance of irritation to the wearer;
- whereby adequate support and maximum comfort are provided the user during sporting activities.

## 4,314,570
## CAPILLARY RECEPTACLE

Walter Sarstedt, 5223 Nümbrecht/Rommelsdorf, Fed. Rep. of Germany

Continuation of Ser. No. 960,249, Nov. 13, 1978, abandoned. This application Aug. 18, 1980, Ser. No. 178,908
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1977, 2751503
Int. Cl.[3] A61B *10/00;* G01N *1/10*
U.S. Cl. 128—763 11 Claims

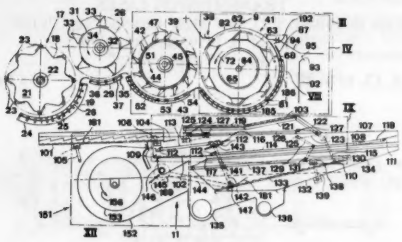



1. A capillary receptacle for the extraction and storage of blood, comprising:
- a receiving receptacle having a bottom portion slightly tapering inwardly toward a closed bottom, said tapered portion extending over a substantial portion of the length of the receiving receptacle and defining a tapered receiving chamber, a cylindrical upper portion adjacent to the bottom portion, and a substantially cylindrical top portion, having a larger inner diameter than that of said upper portion, adjacent to the cylindrical upper portion and open at the upper end thereof; and
- a removable insert having a cylindrical main portion, inserted into the top portion of said receiving receptacle, and a short portion, the interior of which is funnel shaped, adjacent to the cylindrical main portion, the tip of the short portion having such a small inner diameter that blood externally thereof is drawn in by capillary action and the main portion of said insert having such a large inner diameter that the entering blood is able to freely flow onto and off therefrom into said receiving receptacle without being hindered by capillary action; and
- wherein the outside of the cylindrical main portion of said insert and the inside diameter of the top portion of said receiving receptacle are so shaped that the outside of the cylindrical main portion is tightly received into the inside of said top portion with a venting duct provided therebetween.

## 4,314,571
## COMBINE HARVESTER

Cyriel R. J. DeBusscher, Damme, and Gilbert J. I. Strubbe, Zedelgem, both of Belgium, assignors to Sperry Corporation, New Holland, Pa.

Filed Nov. 13, 1980, Ser. No. 206,738
Claims priority, application United Kingdom, Nov. 14, 1979, 39372/79
Int. Cl.³ A01F *12/44*
U.S. Cl. 130—27.2 39 Claims



1. A combine harvester with a threshing and separating mechanism for threshing and separating crop material, and a cleaning device for cleaning threshed and separated grain, the cleaning device comprising:

a grain pan positioned to receive threshed and separated grain from the threshing and separating mechanism and to progressively convey said threshed and separated grain in the direction of the discharge end of the grain pan;

a sieve disposed to receive threshed and separated grain from the grain pan including at least a chaffer sieve having a receiving end at a level below the level of the discharge end of the grain pan;

fan means operable to direct a cleaning air blast to the sieve structure for cleaning grain therein;

a precleaning sieve disposed between the grain pan and the chaffer sieve and having a receiving end below the grain pan discharge end;

duct means directing cleaning air blast on the fall between the grain pan discharge end and the receiving end of precleaning sieve;

a further grain pan substantially vertically below the precleaning sieve; and

the further grain pan has a discharge end at a distance from the receiving end of the chaffer sieve thus defining therewith a discharge opening; the arrangement being such that grain received from the precleaning sieve on said further grain pan is conveyed through said discharge opening thus bypassing the chaffer sieve.

## 4,314,572
## METHOD AND COMPOSITION FOR HAIR TREATMENT

Mario de la Guardia, Savannah, Ga., and Donald R. Cowsar, Birmingham, Ala., assignors to Carson Products Company, Savannah, Ga.

Continuation-in-part of Ser. No. 805,149, Jun. 9, 1977. This application Feb. 8, 1980, Ser. No. 119,836
Int. Cl.³ A45D *7/00*
U.S. Cl. 132—7 14 Claims

1. An improvement in a method for treating hair of the type wherein a composition comprising guanidine hydroxide is applied to the hair and is subsequently removed therefrom, the improvement comprising the steps of:

(a) providing a first ingredient comprising a guanidine salt;

(b) providing a second ingredient comprising a quaternary ammonium, hydroxide-form, ion exchange resin;

(c) mixing said first ingredient and said second ingredient so as to produce guanidine hydroxide; and

(d) separating said guanidine hydroxide from said resin.

## 4,314,573
## PROCESS FOR CONDITIONING HAIR

J. George Spitzer, 44 Coconut Row, Palm Beach, Fla. 33480; Dorothea C. Marra, 107 Fernwood Rd., Summit, N.J. 07901; Lloyd I. Osipow, 2 Fifth Ave., New York, N.Y. 10003, and Kevin Claffey, 735 E. 17th St., Brooklyn, N.Y. 11230

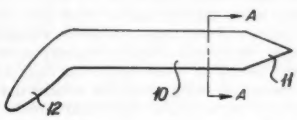
Continuation-in-part of Ser. No. 41,377, May 22, 1979, abandoned. This application Apr. 24, 1980, Ser. No. 143,226
Int. Cl.³ A45D *7/06;* A61K *7/06*
U.S. Cl. 132—7 6 Claims

1. A process for conditioning hair which comprises applying to the hair an effective hair-conditioning amount of an alcohol-soluble fraction of soybean lecithin in solution in a lower alkanol having two or three carbon atoms, and then combing the hair, the alcohol-soluble lecithin fraction lubricating the hair and facilitating combing, and at the same time reducing the accumulation of an electrostatic charge on the hair during combing, and inhibiting fly away.

## 4,314,574
## TOOTH-PICK HAVING ONE FOLDED END AND ASSOCIATED POCKET CONTAINER BOX

Maria Inerte, Via S. Bernardino, 152, Bergamo, Italy

Filed Oct. 4, 1979, Ser. No. 81,852
Claims priority, application Italy, Oct. 5, 1978, 22957/78[U]
Int. Cl.³ A61C *15/00*
U.S. Cl. 132—89 2 Claims

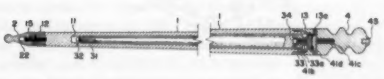



1. The combination of a laminar toothpick with a pocket container, both said toothpick and said container being flat and lying substantially in the same plane, the container walls and the laminar toothpick contacting each other inside said container, the toothpick comprising a straight central portion of a constant thickness, terminating at one end in a sharp point, while the other end is angular, lying in the same plane but disposed at about 45° to the axis of said central portion, said point and said angular end being integral with said central portion, said angular end having adjacent the first portion the same thickness as the central portion, but thence immediately tapering, toward the tip, and terminating in a rounded edge.

## 4,314,575
## MULTI-PURPOSE STICKS OR CANES

Chin-Tui Kuo, No. 1-10, Ta Ho I Hsiang, Hsi Tun District, Taichung, Taiwan

Filed Feb. 27, 1980, Ser. No. 124,966
Int. Cl.³ A45B *3/00, 3/14*
U.S. Cl. 135—66 3 Claims



1. A multi-purpose cane comprising an elongated hollow tubular outer body having a continuously tapering configura-

tion along its length, a hollow tubular metallic sleeve member fixedly attached to the smaller end of said outer body having an outer diameter the same as that of said smaller end so that its outer surface is continuous with that of said body and extending beyond said smaller end to provide a recess therein, an externally threaded extension extending coaxially from said smaller end beyond said sleeve, a metallic ground contacting member having a tapering cylindrical configuration the larger end of which has an outer diameter equal to that of said sleeve, said ground contacting member having a coaxial threaded bore to threadedly engage said threaded extension and a reduced extension on its larger end to interfit in close fitting relationship within said recess, the larger end of said outer body being reduced in diameter to form a shoulder, an external thread on said reduced portion, a metallic hollow tubular connector sleeve having a first internal threaded portion engaging said external thread on said reduced end of said body and a second internal threaded portion having a smaller diameter than and axially displaced from said first threaded portion, the outer diameter of said connector sleeve being equal to that of said larger end of said outer body so that it forms a continuous tapered cylindrical surface therewith, a hand grip member having a connecting end portion of cylindrical shape with an outer diameter substantially equal to that of said connector sleeve to form a continuous tapered surface therewith, a first reduced diameter externally threaded extension on said connecting end for threaded engagement with said second internal threaded portion of said connector sleeve, a second reduced diameter externally threaded extension on said connecting end of the same size as said threaded bore in said ground contacting member, an elongated cylindrical continuously tapering coaxial bore within said outer body, the larger diameter of which is at the same end as that of said outer body, an elongated cylindrical continuously tapering inner body removably insertable within said bore in said outer body, the largest diameter of said inner body being slightly smaller than said second internal threaded portion of said connector sleeve, a metallic connector sleeve on the larger end of and threadedly connected to said inner body having an outer cylindrical tapering surface the larger diameter of which equals the smaller diameter of said sleeve member on the smaller end of said outer body, a reduced coaxial extension on said connector sleeve of said inner body having the same shape and size as said reduced extension on said ground contacting member, and a coaxial threaded bore in said connector sleeve of said inner body having the same size as said bore in said ground contacting member, so that said ground contacting member and said inner body may be interchangeably attached by said threaded extensions to said smaller end of said outer body or to said hand grip member when stored in said elongated bore.

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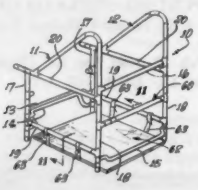
**4,314,576**

## UNIVERSAL SELF HELP AID APPARATUS FOR INVALIDS

**Charles W. McGee, 445 Thoma St., Reno, Nev. 89502**

**Filed Jan. 10, 1980, Ser. No. 110,818**
**Int. Cl.³ F16M *13/08;* A61H *3/04***
**U.S. Cl. 135—67** **8 Claims**



1. Apparatus for assisting a crippled individual in movement and exercise comprising: a frame consisting of two side frame members, wherein said side frame members include angularly disposed members to be gripped by an individual using the device; elongated members joining said two side frame members at one of their ends include members suitable to engage the lower legs of the person using the same in a clamping manner; elongated members joining the other end of said side frame members in such a manner as to allow for entry from that end from a wheeelchair.

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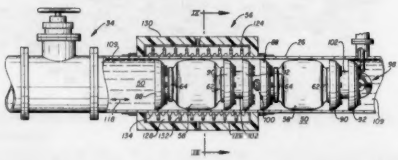
**4,314,577**

## INSTALLATION, HYDROSTATIC TESTING, REPAIR AND MODIFICATION OF LARGE DIAMETER FLUID TRANSMISSION LINES

**Beryle D. Brister, P.O. Box 2329, Amarillo, Tex. 79105**

**Filed Jul. 9, 1979, Ser. No. 55,961**
**Int. Cl.³ F16L *55/12***
**U.S. Cl. 137—13** **4 Claims**



1. A method for sealing a section of a fluid transmission line comprising the steps:

positioning within the interior of the fluid transmission line section a freeze pig having a sealed expandable boot filled with a quantity of a liquid solution which expands when frozen;

positioning refrigeration means around the section of fluid transmission line enclosing the pig; and

freezing the liquid solution within the expandable boot by introducing a refrigerant into said refrigeration means to cause said boot to expand into sealing engagement with the interior wall of said transmission line.

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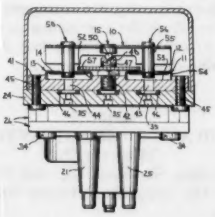
**4,314,578**

## FLUID SIGNAL TRANSMITTING APPARATUS

**Warren A. Lederman, Bayside, Wis., assignor to Johnson Controls, Inc., Milwaukee, Wis.**

**Filed Oct. 22, 1979, Ser. No. 87,580**
**Int. Cl.³ G05D *16/00***
**U.S. Cl. 137—84** **4 Claims**



1. A fluid signal inverting apparatus comprising a signal chamber having a signal port and including a diaphragm forming one wall thereof, a feedback chamber having a signal port and including a diaphragm forming one wall thereof and mounted in spaced relationship to said signal chamber, said diaphragms of said signal chamber and feedback chamber being matched and located in a common plane, a motion balance lever member spanning said diaphragms, rigid interconnecting means connecting the diaphragms to said balance lever member and supporting said balance lever member for movement relative to said signal chambers, a valve means located in

fixed relationship intermediate said chambers and having a valve operator, said valve operator being connected to said lever member and including a pivotal connection and responsive to the movement of the lever member associated with movement of said diaphragms to position said valve operator and valve means in accordance with the lever member movement, and including a base plate having said chambers formed by recesses in one wall of said plate and said diaphragms each being a cup-shaped diaphragm having the sidewalls sealed in said recesses, said rigid interconnecting means including pin members affixed to the center of said diaphragms and to the aligned portion of said lever members, said valve means being adjustably secured to said plate for axial positioning toward and away from said valve operator, said valve operator being a spacer member secured to the lever member and extending into operative engagement with the valve means.

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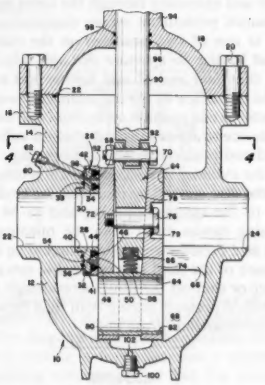
**4,314,579**

## GATE VALVE

**Charles Wheatley, 2909 E. 29th St., Tulsa, Okla. 74135, and Phyllis A. Wheatley, 25308 E. 65th St., Broken Arrow, Okla. 74012**

**Filed Mar. 18, 1980, Ser. No. 131,286**
**Int. Cl.³ F16K *23/00***
**U.S. Cl. 137—312** **3 Claims**



1. A gate valve comprising a valve body, oppositely disposed inlet and outlet ports provided in the body, valve seat means removably secured to the inner end of the inlet port, an annular shoulder provided on the inner end of the outlet port, gate means interposed between the valve seat means and annular shoulder and reciprocal in directions substantially perpendicular to the longitudinal axes of the inlet and outlet ports to provide alternate open and closed positions for the valve, the outer faces of said gate means being substantially flat and mutually parallel for simultaneously engaging the valve seat means and annular shoulder in the closed position of the valve and having passageway means extending therethrough for alignment with the inlet and outlet ports in the open position of the valve, and spring urged internally disposed wedge means provided in said gate means for facilitating the sealing engagement of the gate means with the valve seat means in the closed position of the valve and facilitating the movement of the gate means to the open position, said gate means comprising a pair of plate members, each of said plate members being provided with an outer face substantially perpendicular to the axis of the inlet and outlet ports and an innerface inwardly diverging, bolt means securing said plate members in spaced relationship and providing for a limited movement of the plate members in the axial direction of the inlet and outlet ports, said spring urged wedge means being disposed between the plate members and having bore means for receiving the bolt means therethrough whereby the wedge means is movable in a direction perpendicular to the axis of the inlet and outlet ports independent of the movement of the plate members during the initiation of a closing and opening of the valve and simultaneously therewith for completion of the opening and closing of the valve.

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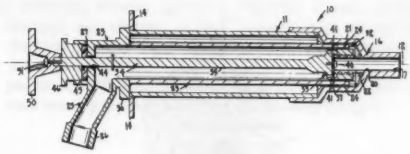
**4,314,580**

## FAUCET STRUCTURE

**Dennis D. Steinwand, 201-6th Ave. N.W., Mandan, N. Dak. 58554**

**Filed Jun. 9, 1980, Ser. No. 157,884**
**Int. Cl.³ F16L *5/00***
**U.S. Cl. 137—360** **7 Claims**



1. A faucet structure comprising, in combination:
a hollow housing extending along an axis between first and second ends;
inlet means at said second end of said housing for coupling to a water supply conduit;
valving means at said second end actuable to selectively enable and prevent flow of water from said conduit into said housing;
a hollow liner removably contained within said housing along said axis between first and second ends;
an outlet tap closing said first end of said liner beyond said first end of said housing;
means at said second ends of said housing and said liner for releasably forming a watertight seal therebetween;
an actuator extending axially within said housing and said liner from a first end which sealingly traverses said outlet tap to a second end connected to said valving means, whereby to open said valving means enabling flow of water from said conduit, and to close said valving means to prevent flow of water from said conduit,
said liner being removable through said first end of said housing over said actuator with the valving means closed thereby permitting replacement of said liner without enabling the flow of water from said conduit into said housing; and
means normally retaining said liner in said housing.

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**4,314,581**

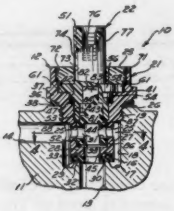
## ROTARY VALVE WASHERLESS CARTRIDGE

**Donald C. Schrock, Bay Village, Ohio, assignor to Streamway Corporation, Westlake, Ohio**

**Filed Oct. 19, 1979, Ser. No. 86,473**
**Int. Cl.³ F16K *25/00***
**U.S. Cl. 137—454.5** **1 Claim**

1. A valve assembly comprising a housing having a cavity including an annular seat adjacent an inner end of the cavity, an inlet passage communicating with the housing cavity through an area central of the annular seat, an outlet passage connected to the housing cavity, a cartridge assembly including a rigid hollow bonnet and a stem supported for rotation in the bonnet, the bonnet extending into the housing cavity, threaded means for securing the bonnet in the housing cavity, annular seal means at an inner end of the bonnet compressed by forces developed by said threaded means and sealing against the annular seat to isolate the inlet passage from the housing cavity, an inner portion of the bonnet forming a tubular wall including a circular bore, an outlet port extending radially through the tubular wall, means supporting said stem in an axially fixed position, an outer portion of said stem being ex-

posed at an outer end of the bonnet to permit manual rotation thereof, an inner end portion of the stem being disposed in said circular bonnet bore, said inner stem portion being cup-shaped and opening in the direction of said annular seat, said inner stem portion being formed of a relatively soft, elastomeric material and including a radial port through a sidewall of the cup-shaped area, said radial stem port being in axial alignment with said bonnet outlet port and capable of being disposed in circumferential alignment or misalignment with said bonnet outlet port through selective rotation of said stem, said outer stem portion being formed of a material relatively more rigid than the material forming the inner stem portion, said inner and outer stem portions including means providing an interlocking



torque transmitting connection therebetween, means for limiting rotation of the stem to substantially less than one full turn, an O-ring disposed in said bonnet about said stem axially outward of said inner cup-shaped stem portion to prevent leakage of fluid axially along said stem, said cup-shaped portion including a circumferentially continuous tubular zone axially outward of said stem port, an axially outer portion of said stem being relatively rigid, said cup-shaped portion having a free configuration providing a slight degree of interference with said circular bonnet bore, said cup-shaped portion being responsive to fluid pressure therein when said ports are misregistered to expand radially outwardly into tight sealing engagement with said bonnet bore to prevent radial fluid flow through said ports and axial leakage along said stem.

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**4,314,582**

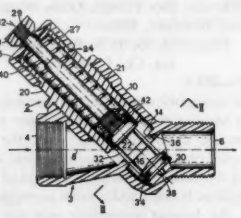
## COMBINED PRESSURE-REGULATOR AND MANUAL SHUT-OFF VALVE

**Mordeki Drori, 89 Zahal St., Kiron, Israel**

**Continuation-in-part of Ser. No. 669,663, Mar. 23, 1976, abandoned, and a continuation-in-part of Ser. No. 495,497, Aug. 4, 1974, abandoned. This application Aug. 24, 1976, Ser. No. 717,356**

**Int. Cl.³ F16K *31/14***

**U.S. Cl. 137—495** **3 Claims**



1. A fluid flow control device useful as a combined manual shut-off valve and pressure regulator effective to regulate the pressure downstream of a line during both fluid flow and non-flow conditions therein, comprising: a housing having an inlet connectable to the upstream side of the line, an outlet connectable to the downstream side of the line, and an inwardly extending annular flange formed within the housing between the inlet and outlet and defining a circular opening providing a fluid passageway therebetween, the annular flange having a longitudinal axis inclined at an acute angle to the axis of the inlet and intersecting same at the center of said opening; an internally threaded cylindrical socket formed on the housing at the inlet side thereof and having a longitudinal axis aligned with that of the annular flange and the center of said opening; an externally threaded cylinder threaded at its mid-portion within said socket; a piston of the same diameter as said opening sealingly slidable within the cylinder; a coil spring biassing means urging the piston towards said opening; a disc of the same diameter as said opening and said piston; said disc being movable from an open position on the outlet side of said opening to a closed position within said opening; a sealing ring between said disc and opening when the disc is in its closed position within said opening; connecting means including at least one rod securing the piston at the inlet side of the opening to the disc at the outlet side of the opening while permitting the fluid to flow between the disc and the piston through the opening when the disc is in its open position such that the inlet pressure is applied equally to the piston and to the confronting face of the disc producing substantially equal and opposite forces, whereas the outlet pressure is applied to the opposite face of the disc tending to move the disc, and the piston in the cylinder, against the spring biassing means, a further rod fixed to the piston and extending through the outer end of the cylinder; and manual presettable means comprising a cap axially presettable in one of two positions on the outer end of said cylinder and having an aperture through which said further rod passes, the outer end of said further rod carrying a stop engaging the outer face of the cap such that presetting the cap on the cylinder in one position away from said circular opening causes the device to act as a manual shut-off valve by fixing the disc in its closed position within said opening, and presetting the cap on the cylinder in a second position towards the opening causes the disc carried by the piston to be disposed on the outlet side of the circular opening and to be urged by the spring biassing means away from the opening whereby the device acts as a pressure-regulator wherein an increase in the outlet pressure of the fluid moves the disc towards said opening to reduce or shut-off the flow therethrough and thereby to regulate the fluid pressure during both fluid flow and non-flow conditions downstream of the line.

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**4,314,583**

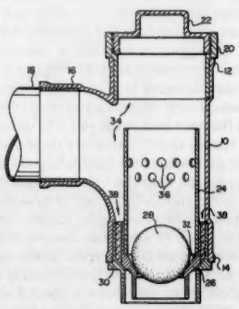
## BACKWATER VALVE

**Harold A. Peterson, 8300 Ryan Rd., Richmond, British Columbia, Canada (V7A 2E6)**

**Filed Jun. 9, 1980, Ser. No. 157,473**

**Int. Cl.³ F16K *15/04***

**U.S. Cl. 137—533.11** **5 Claims**



1. A check valve insert for installation between the inlet and outlet ports of a fluid conduit, said outlet port communicating with a drainage conduit, said insert comprising:

(a) an apertured coupler for insertion into the inlet port of said fluid conduit, said coupler including a valve seat around said aperture;

(b) a cylindrically apertured guide sleeve fixed to said coupler to project into said fluid conduit above said valve seat and permit fluid communication from said inlet port through said coupler aperture and through said sleeve aperture to said outlet port, said sleeve including a plurality of apertures spaced around the upper end of said sleeve; and,

(c) a ball closure member positioned within said sleeve for sealing engagement against said valve seat to prevent fluid communication from said outlet port to said inlet port;

wherein, when said insert is installed in said fluid conduit, said plurality of sleeve apertures are positioned above the lowest point of entry from said fluid conduit outlet port to said drainage conduit.

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**4,314,584**

## ANGLE VALVE

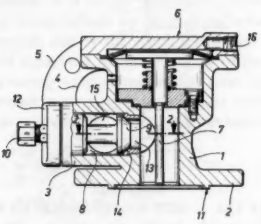
**Manfred Sieglitz, Bremen, Fed. Rep. of Germany, assignor to Gustav F. Gerdts KG, Bremen, Fed. Rep. of Germany**

**Filed Aug. 21, 1978, Ser. No. 935,287**

**Claims priority, application Fed. Rep. of Germany, Aug. 25, 1977, 2738294; Sep. 21, 1977, 2742414**

**Int. Cl.³ F16K *31/145;* B65D *47/20***

**U.S. Cl. 137—613** **7 Claims**



**1.** An angle valve mountable on the exterior of a container having a container valve disposed therein, comprising:

a unitary valve housing including a container-side connecting member having a front face and a channel formed therein opening onto said front face for communication with said container and a loading-side connecting member, which has a channel formed therethrough and which is capable of communication with a loading line, said valve housing further including an intermediate connecting member mounted on said container-side connecting member and extending radially therefrom, said intermediate connecting member having a free end on which is mounted a support for supporting a valve spindle and a receiving chamber formed therein which establishes communication between said channels of said loading-side and said container-side connecting members, with said channel of said loading-side connecting member disposed to terminate and discharge directly into said receiving chamber and with said loading-side connecting member disposed tangentially relative to said container-side connecting member and extending radially outwardly from said intermediate connecting member between said support and said container-side connecting member, said loading-side connecting member having an axis which is disposed at a fixed angle to said front face and also having an inner end coupled to said intermediate member and an outer end ascending away from said front face;

a valve seat mounted within said receiving chamber;

a stroke-adjustable valve head mounted within said receiving chamber and disposed for cooperative engagement with said valve seat, said valve head being disposed laterally adjacent to said container-side connecting member so as to leave said channel of said container-side connecting member unobstructed for the receipt therein of an actuating plunger;

a manually-adjustable valve spindle at least partially mounted in said receiving chamber and having an inner end coupled to said valve head, and an outer free end supported by said support, said valve spindle being mounted with its axis substantially parallel to the axis of said intermediate member and to said front face of said container-side connecting member such that its outer free end does not extend substantially above said actuating member and said loading-side connecting member, said spindle being adjustable to control communication between said container-side connecting channel and said receiving channel;

an actuating plunger which is disposed in and extends through said channel of said container-side connecting member for coupling with the container valve disposed in the container; and

a pneumatically operable actuating member supported on said housing and coupled to said actuating plunger.

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**4,314,585**

## PROPORTIONAL TYPE ELECTROMAGNETIC VALVE

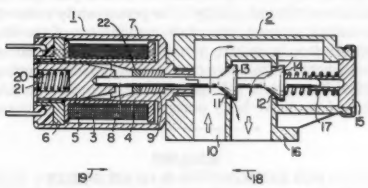
**Torazo Nishimiya, Mito; Masamitsu Okumura, and Seisaku Numakura, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Aug. 22, 1979, Ser. No. 68,577**

**Claims priority, application Japan, Aug. 23, 1978, 53/103315**

**Int. Cl.³ F16K *31/06, 1/44***

**U.S. Cl. 137—625.34** **6 Claims**



**1.** A proportional type electromagnetic valve for controlling flow rate of fluid comprising, electromagnetic driving means having axially movable output shaft means whose moving stroke is in proportion to an input current fed to the electromagnetic driving means, a plurality of valve means mounted on the output shaft means for controlling flow rate of fluid in proportion to the stroke of the output shaft means, a first spring means biasing the output shaft means in a direction opposite to a direction of force applied to the output shaft means by the electromagnetic driving means, and a second spring means biasing said output shaft means in the same direction as the direction of force applied to said output shaft means by said electromagnetic driving means, each of said first and second spring means having a linear force-displacement characteristic such that the sum of the spring forces of said first and second spring means biasing said output shaft means is in linear proportion to the stroke of said output shaft means.

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**4,314,586**

## DISPOSABLE VALVE

**Bern D. Folkman, Burbank, Calif., assignor to Tronomed International, Inc., Costa Mesa, Calif.**

**Continuation of Ser. No. 937,952, Aug. 30, 1978, abandoned. This application Jun. 27, 1980, Ser. No. 163,778**

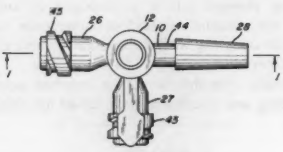
**Int. Cl.³ F16K *5/04***

**U.S. Cl. 137—625.47** **9 Claims**

**5.** A two-piece, three-way disposable plastic valve comprising:

a valve body having a substantially straight inner cylindrical surface bore with three peripherally spaced ports and an annular tapered surface adjacent one end of the bore extending into the bore and forming a first flat annular stop member;

a respective tubular extension aligned with and extending from each port, at least two of the tubular extensions having a first diameter portion adaptable for connection to a fluid conduit and a second reduced diameter portion adjacent their respective ports to minimize the quantity of plastic adjacent the valve body which is subject to cooling during solidification to prevent sink warpage of the cylindrical bore which could permit leakage of the valve;




a substantially hollow valve core rotatably mounted in the valve body with an outside cylindrical surface sealingly contacting the bore;

conduit means in the valve core capable of fluidly connecting at least two valve body ports;

a second stop member on the valve core of a complimentary configuration to the tapered portion of the valve body wherein the valve core can be forced past the tapered portion of the valve body to be permanently secured in an operative position, the relative alignment of the first and second stop members permitting a limited axial sealing movement of the valve core within the valve body cylindrical bore while still maintaining an operative relationship of the valve body ports with the conduit means.

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**4,314,587**

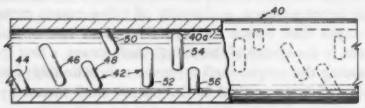
**RIB DESIGN FOR BOILER TUBES**

**Charles D. Hackett, Tunnel Hill, Ga., assignor to Combustion Engineering, Inc., Windsor, Conn.**

**Filed Sep. 10, 1979, Ser. No. 73,967**

**Int. Cl.³ F16L *11/14***

**U.S. Cl. 138—38** **9 Claims**




1. A boiler tube for effecting the heating by means of high temperature gaseous products of combustion flowing in surrounding relation thereto of a fluid flowing therethrough comprising a metallic cylinder having a hollow interior defining a passage for the fluid to flow through, means provided on the inner wall surfaces of said metallic cylinder for preventing the occurrence of nucleate boiling of the fluid flowing through the hollow interior of said metallic cylinder, said means comprising ribbing consisting of a multiplicity of individual ribs that are arranged in a preselected variably configured pattern so as to inbue each increment of length of said metallic cylinder with the proper fluid flow properties required for purposes of achieving a maximization without causing nucleate boiling of the rate of heat transfer through the walls of said metallic cylinder to the fluid flowing through the hollow interior of said metallic cylinder, the arrangement of said multiplicity of individual ribs in said preselected variably configured pattern being determined in accordance with parameters selected from amongst a plurality of variable factors to fulfill certain preestablished design criteria having for their objective the prevention of nucleate boiling.

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**4,314,588**

**LOOM**

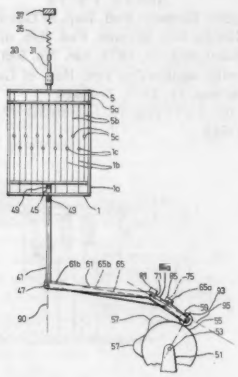
**Francisco Speich, Gipf-Oberfrick, Switzerland, assignor to Textilma AG, Switzerland**

**Filed Jan. 21, 1980, Ser. No. 113,600**

**Claims priority, application Switzerland, Feb. 15, 1979, 1490/79**

**Int. Cl.³ D03C *5/00***

**U.S. Cl. 139—79** **9 Claims**




1. A loom comprising:

(a) a plurality of heald devices, each of said heald devices being generally disposed in a respective one of a plurality of parallel planes and each of said heald devices being displaceable for reciprocating displacement along a respective path in its said respective one of the parallel planes, said plurality of heald devices being so disposed that a common central plane extends centrally of each of said plurality of heald devices, said common plane being disposed parallel to said paths and perpendicular to each of said parallel planes,

(b) a plurality of levers, each lever being operatively connected to one of the heald devices and pivotable about a respective pivot axis to cause said reciprocatory displacement of a respective one of said plurality of heald devices, each pivot axis of said levers being extended at a right angle said parallel planes,

(c) drive means for pivoting said lever,

(d) each lever contacting said drive means at a drive input location spaced from the respective pivot axis of said lever by a first distance,

(e) a plurality of intermediate elements, each of said intermediate elements being connected between a respective one of said heald devices and a respective one of said levers at a drive output location spaced from the respective pivot axis of said lever by a second distance, and

(f) said pivot axis of each of at least two levers being mutually offset relative to each other, said at least two levers having a different ratio of said first distance to said second distance relative to each other so that mutually different stroke transmission ratios for said at least two levers results.

4,314,589

## DUPLEX FORMING FABRIC

John G. Buchanan, Ottawa, and Donald G. MacBean, Barrhauen Cres., both of Canada, assignors to JWI Ltd., Montreal, Canada

Continuation of Ser. No. 953,928, Oct. 23, 1978. This application Aug. 20, 1980, Ser. No. 179,733
Int. Cl.[3] D03D *15/00*
U.S. Cl. 139—383 A 4 Claims

1. A paper forming fabric having two layers of synthetic weft strands with interwoven synthetic warp strands and approximately 100% warp fill, the upper surface of the fabric having a plurality of knuckles formed by said interwoven weft and warp strands being essentially tangent to the plane of the fabric on which the paper is to be formed, and wherein the upper layer of the said fabric comprises a regular array of mesh openings which are spaced apart in the weft direction by a distance not greater than the thickness of a single intervening warp strand and in the warp direction by a distance not greater than the thickness of a single intervening weft strand, said mesh openings being defined by the spacing between adjacent upper weft strands and by the spacing between warp strands which are held separated within the body of the fabric by at least one intervening warp strand, said at least one intervening warp strand being woven with lower layer weft strands and extending in its entire length below said top layer weft strands.

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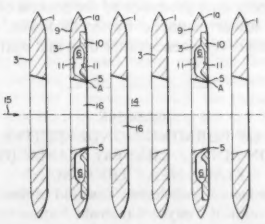
4,314,590

## WEFT GUIDING COMB FOR A JET LOOM

Hajime Suzuki, Anjyo; Yoshifumi Umemura, Toyoake; Masahiko Kimbara, Kariya, and Yoshimi Iwano, Ohbu, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Mar. 11, 1980, Ser. No. 129,410
Claims priority, application Japan, Mar. 14, 1979, 54-3014
Int. Cl.[3] D03D *47/30*
U.S. Cl. 139—435 6 Claims



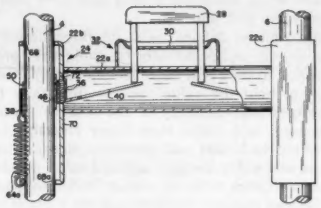
1. A weft guiding comb for a jet loom consisting of a root portion, an annular portion integrally connected to the upper end of the root portion and forming an aperture with a slit, a fluid passage formed in said root portion and said annular portion to allow a flow of fluid to flow therethrough, and outlet means arranged around the periphery of the aperture for discharging the flow of fluid passed through the fluid passages, at least said annular portion being composed of two members each extending in the radial direction of the aperture and cooperating with each other to form said fluid passage and said outlet means, said outlet means being defined by radially inward peripheral edges of said two members.

4,314,591

## LOG SPLITTER WITH IMPROVED CLAMP

Michel A. Pierrat, 48 Farrwood Dr., Andover, Mass. 01810

Continuation-in-part of Ser. No. 873,060, Jan. 27, 1978, abandoned. This application Jun. 29, 1979, Ser. No. 53,199
Int. Cl.[3] B27L *7/00*
U.S. Cl. 144—193 A 19 Claims



1. A log splitter comprising first and second guide members, means supporting said guide members in spaced parallel relationship, a support positioned between said guide members for supporting a log to be split, a carriage extending between said guide members, a splitting wedge carried by said carriage, clamping means secured to said carriage and arranged to releasably clamp said carriage to said first guide member including a locking member surrounding and movable along said first guide member, an operating arm extending from said locking member and arranged to tilt said locking member with respect to the longitudinal axis of said first guide member, a gripper shoe positioned between said locking member and said first guide member, and a slipper shoe positioned on the side of said first guide member opposite said gripper shoe between said first guide member and said locking member, and drive means for moving said support into closing relationship with said wedge.

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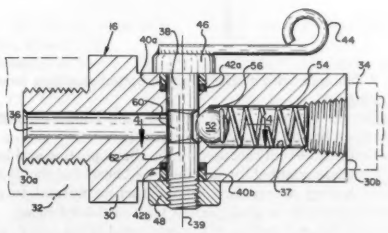
4,314,592

## TREE FELLING SYSTEM WITH CAM-OPERATED HYDRAULIC CHECK VALVE

Elmer R. Silvey, 1231 Dutton Rd., Eagle Point, Oreg. 97524

Filed Dec. 31, 1979, Ser. No. 108,666
Int. Cl.[3] B66F *3/24*; A01G *23/08*
U.S. Cl. 144—34 A 2 Claims



2. In a hydraulic tree-felling system having a hydraulic pump, a primary hydraulic line leading from said pump, and a plurality of hydraulic jacks connected in parallel to said primary line by secondary hydraulic lines, a hydraulic check valve disposed in each of said secondary lines between each of said jacks and said primary line comprising:

a valve body defining outlet and inlet fluid passages in fluid communication with one another and a valve seat therebetween,

said inlet passage being in fluid communication with said pump,

said outlet passage being in fluid communication with one of said jacks,

a valve stem journaled at its opposite ends in the housing for rotation on an axis and passing through the intersection of said passages, said stem being manually rotatable,

wall means defining a valve seat within said outlet passage adjacent said valve stem,

a valve member disposed in the outlet passage,

resilient means resiliently urging said valve member toward said valve seat, and

camming means defined by an intermediate portion of said valve stem and selectively rotatable with said stem to a position forcing said valve member away from said valve seat to hold the valve open to fluid flow through the passages independently of the relative pressures in the passages, said valve stem being rotatable to a second position such that said camming means is spaced apart from said valve member and said valve member is operable as a check valve to enable fluid flow under pressure from said pump to said one jack but prevent reverse fluid flow under pressure through said valve in a direction from said jack toward said pump.

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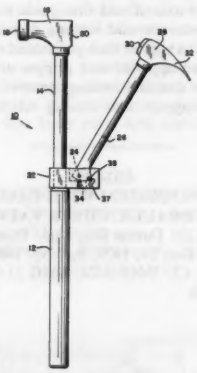
## 4,314,593
## HAMMER WITH SELECTIVELY ACTUATED AUXILIARY HEAD

**Boris Schwartz, 625 Lafayette Ave., Hawthorne, N.J. 07506**

**Filed Jul. 9, 1980, Ser. No. 167,135**
**Int. Cl.³ B25C *1/00***
**U.S. Cl. 145—29 R** **20 Claims**



**1.** A hammer with a selectively actuated auxiliary head and including:

(a) a handle having a shank portion, said handle adapted for grasping by the user of the hammer;

(b) a first head fixedly secured to the shank portion and having a front face adapted for striking a nail head and the like, said head having a rear face with a surface normal to a line substantially in axial alignment with said fixed head;

(c) a fixed bracket carried at the upper end of the handle grasping portion;

(d) a second auxiliary hammer head fixedly secured to a second shank portion, said second head having a face surface contoured to engage the rear face of the first head;

(e) pivot pin means carried by the fixed bracket and disposed to retain said second shank portion so as to control and guide the swing of the auxiliary head and to permit this second auxiliary head, when moved in an arc established by the pivot means, to engage the rear face surface of the first head to provide further impact and driving force to said first head;

(f) means for limiting the rearward swing of said second auxiliary head, and

(g) means for selectively securing said first and second heads to each other in a contiguous relationship so that the driving force is concentrated.

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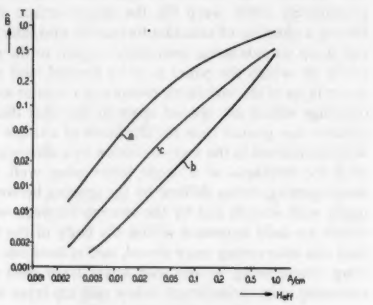
## 4,314,594
## REDUCING MAGNETIC HYSTERESIS LOSSES IN CORES OF THIN TAPES OF SOFT MAGNETIC AMORPHOUS METAL ALLOYS

**Friedrich Pfeifer, Bruchköbel, and Wernfried Behnke, Hanau, both of Fed. Rep. of Germany, assignors to Vacuumschmelze GmbH, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 881,039, Feb. 24, 1978, abandoned. This application Apr. 29, 1980, Ser. No. 144,895**
**Claims priority, application Fed. Rep. of Germany, Feb. 26, 1977, 2708472; Mar. 5, 1977, 2709626**
**Int. Cl.³ C21D *1/04*; H01F *3/04***
**U.S. Cl. 148—108** **23 Claims**




**1.** In an improved method for reducing magnetic hysteresis losses in a starting magnetic core formed of a thin tape consisting of soft-magnetic, amorphous metal alloy, the steps comprising

(a) heating said core to a temperature in the range above the Curie temperature and below the crystallization temperature of said alloy for a time sufficient to relax mechanical tensions in said tape, and then

(b) cooling the so-heated said core to a temperature below its Curie temperature at a controlled rate,

said heating and said cooling being conducted in an oxidizing atmosphere.

**20.** A magnetic core produced by the process of claim **1**, said core having lower magnetic hysteresis losses, lower remanences, and lower remanence ratios than said starting magnetic core.

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## 4,314,595
## METHOD OF FORMING NONDEFECTIVE ZONE IN SILICON SINGLE CRYSTAL WAFER BY TWO STAGE-HEAT TREATMENT

**Kazuhiko Yamamoto, Yokohama; Yoshiaki Matsushita; Masaru Kanamori, both of Tokyo; Kazutoshi Nagasawa, Yokohama; Naotsugu Yoshihiro, Matsudo, and Seigo Kishino, Hachioji, all of Japan, assignors to VLSI Technology Research Association, Japan**

**Filed Jan. 8, 1980, Ser. No. 110,456**
**Claims priority, application Japan, Jan. 19, 1979, 54-4929**
**Int. Cl.³ H01L *21/322, 7/52***
**U.S. Cl. 148—1.5** **13 Claims**

**1.** A method of forming a nondefective zone in a silicon single crystal wafer comprising:

a first-stage heat treatment of heating the wafer for ten (10) to one hundred (100) hours at a temperature within the range of between 500° C. and 1000° C. to form a number of defect-causing nuclei within the wafer; and

a second-stage heat treatment of heating the thus treated

wafer at a temperature higher than that used in the first-stage, thereby converting the surface region of the wafer into a nondefective zone and forming a micro defect-rich

zone at the interior center region of the wafer, the defect-causing nuclei being mainly involved in the formation of the micro defects in the second-stage heat treatment.

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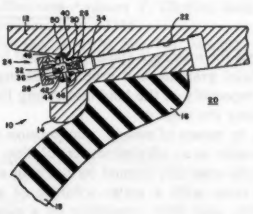
**4,314,596**

## RETENTION DEVICE FOR CAPTURING A SPENT THERMAL FUSE

**Robert J. Keresztes, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.**

**Filed Sep. 10, 1979, Ser. No. 73,973**
**Int. Cl.³ B60C *5/00***
**U.S. Cl. 152—330 R** **1 Claim**



1. In an aircraft wheel having a rim with a tire attached thereto to define a pressure chamber for a fluid, and a relief valve connected to the pressure chamber through a passage in the rim, said relief valve having a core member made of a fusible alloy located in a conical bore connected to said passage, the core member responding to a predetermined temperature by changing shape and being expelled from the relief valve by the pressure of the fluid in the pressure chamber to thereafter allow fluid to escape through the passage and conical bore and thereby prevent damaging the tire from a predetermined pressure resulting from the predetermined temperature, the improvement comprising:

a cylindrical projection extending from the relief valve having a cylindrical bore aligned with the core member and vent holes for connecting the cylindrical bore with the surrounding environment, said vent holes being located adjacent a shoulder that separates said cylindrical bore from the conical bore, said cylindrical projection having a groove on its peripheral surface, said vent holes terminating in said groove;

a resilient band located in said groove to cover the vent holes to prevent contaminants from entering the cylindrical bore; and

an end cap attached to said cylindrical projection to establish a retention chamber in said cylindrical bore, said core member on being expelled from the relief valve being retained in said retention chamber adjacent said end cap to prevent injuring any person or damaging any property resulting from the expulsion of the core from the relief valve, said fluid in the chamber thereafter flowing from the passage through the vent holes to the surrounding environment by expanding the resilient band over the vent holes to reduce the fluid pressure in the pessure chamber.

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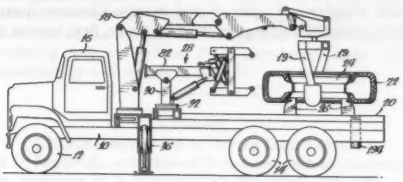
**4,314,597**

## TIRE MOUNTING AND DEMOUNTING APPARATUS AND METHOD

**Francis L. Zrostlik, and John J. Collins, both of Garner, Iowa, assignors to Iowa Mold Tooling Co., Inc., Garner, Iowa**

**Continuation-in-part of Ser. No. 945,915, Sep. 26, 1978, abandoned. This application Jan. 4, 1980, Ser. No. 109,681**
**Int. Cl.³ B60C *25/06***
**U.S. Cl. 157—1.11** **23 Claims**



1. A method of mounting a tire having opposed, normally spaced beads on a drop center wheel comprising the steps of

(a) disposing the tire partly on the wheel such that part of one of the beads is between the flanges of the wheel;

(b) nonaxially urging, at a location remote from said bead part, the tire away from the wheel to draw said part into the drop center while axially moving the tire, at said remote location, toward the wheel so that said beads at said remote location are disposed between the flanges of the wheel,

(c) bringing both beads at said remote location towards each other into sufficient proximity that both may enter the drop center of the wheel,

(d) nonaxially urging said tire at said remote location toward said wheel to dispose said both beads at said remote location within the drop center of the wheel; and

(e) axially moving said tire adjacent said part toward said wheel to cause the part of the bead opposite said bead part to be disposed between the wheel flanges.

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**4,314,598**

## INTEGRAL WINDOW UNITS

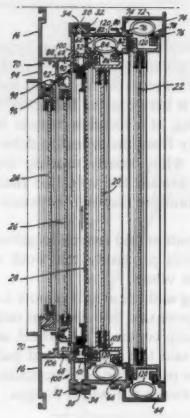
**Edgar B. Roesch, Pennington, N.J., assignor to The Roesch Trust, Bristol, Pa.**

**Continuation of Ser. No. 726,265, Sep. 24, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 848,892**
**Int. Cl.³ E06B *3/32*; A47H *1/00*; E05B *65/04*; E05C *7/02***
**U.S. Cl. 160—90** **10 Claims**

1. An integral window unit comprising a sill member, a header member and a pair of jamb members interconnected to form a generally rectangular window frame, first, second, third and fourth pairs of track means, one track means in each pair being located in one of said jamb members so that the first and second pair of track means each slideably receive a prime window sash and so that the third and fourth pair of track means each slideably receive a storm window sash, each track means in a pair being offset from the track means in an adjacent pair whereby removal of said window sashes is facilitated, each track means in said first and said second pairs of track means including an outer wall portion and first and second spaced-apart inner wall portions extending parallel to the depth of said jamb members, each track means in said first pair of track means further including a first short wall portion spaced from said second track means and a second short wall portion adjacent said second track means, each track means in said second pair of track means including a third short wall

portion adjacent said first track means and a fourth short wall portion spaced from said first track means, said short wall portions extending transverse to said inner and outer wall portions whereby said each track means in said first and second pair of track means is generally rectangular in cross-section, said outer wall portion in each track means in said second pair of track means lying in a common plane with the adjacent inner wall portion of said first pair of track means, said third short wall portion being closer to said first short wall portion than is said second wall portion and said second wall portion being closer to said fourth wall portion than is said third wall portion whereby said first pair of track means is in overlapping relationship with said second pair of track means along the depth of said jamb members.

10. An integral window unit comprising a sill member, a header member and a pair of jamb members interconnected to form a generally rectangular window frame, first, second, third



and fourth pairs of track means, one track means in each pair being located in one of said jamb members so that the first and second pair of track means each slideably receive a prime window sash and so that the third and fourth pair of track means each slideably receive a storm window sash, each track means in a pair being offset from the track means in an adjacent pair, each track means in said first and second pair of track means being generally rectangular in cross-section and each track means in said first pair being in overlapping relationship with the adjacent track means in said second pair, a relatively rigid thermal barrier extending about said window sash between said second and third pair of track means, and a fifth pair of track means inwardly and directly adjacent said thermal barrier, each track means in said fifth pair being located in a different jamb member so that said fifth pair of track means slideably receive a screen member, each of said track means in said fifth pair being made of a material acting as a thermal barrier.

**4,314,599**

## PROCESS FOR MAKING A STARTING MATERIAL FOR THE MANUFACTURE OF ARTIFICIAL GRAPHITE ARTICLES

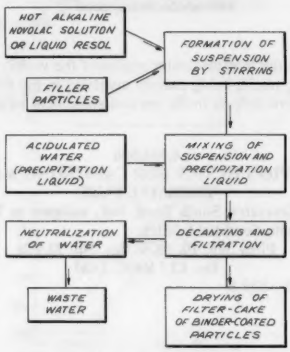
**Hartmut Luhleich, Duren, and Francisco J. Dias, Jülich, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich, Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany**

**Continuation of Ser. No. 886,419, Mar. 14, 1978, abandoned. This application Dec. 18, 1979, Ser. No. 104,755**

**Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2712628**

**Int. Cl.³ C08G *51/24*; C09D *5/02***

**U.S. Cl. 164—16** **6 Claims**


HOT ALKALINE NOVOLAC SOLUTION OR LIQUID RESOL
FORMATION OF SUSPENSION BY STIRRING
FILLER PARTICLES
ACIDULATED WATER (PRECIPITATION LIQUID)
MIXING OF SUSPENSION AND PRECIPITATION LIQUID
NEUTRALIZATION OF WATER
DECANTING AND FILTRATION
WASTE WATER
DRYING OF FILTER-CAKE OF BINDER-COATED PARTICLES

1. A process for making a starting material for the manufacture of artificial graphite and graphite-bearing and graphite-like bodies, especially of the kind containing fine-grain graphites, comprising the steps of:

preparing, by means of mixing, a suspension of particles of a filler powder in an alkaline water solution of a pehnolformaldehyde resin salt formed by reacting a phenolformaldehyde resin with a water solution of an alkali metal hydroxide, said filler consisting of a powdered carbon substance selected from the group consisting of electrographite, natural graphite, carbon black, ground coke, and particulate mixtures of a plurality of the foregoing substances;

forming a coating of phenolformaldehyde resin on said filler particles in said suspension in said resin salt solution by immediate conversion of said dissolved resin salt into pure phenolformaldehyde resin in solid form deposited on said particles, accomplished by mixing acidulated water with said suspension;

separating the coated particles from the water by decantation, filtration, or both decantation and filtration; and

drying the coated powder particles so separated.

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**4,314,600**

## APPARATUS FOR GUIDING AND SUPPORTING A CONTINUOUSLY CAST SLAB

**Bertrand Reymont, Zürich, Switzerland, assignor to Alfred Wertli Inc., Winterthur, Switzerland**

**Filed Mar. 17, 1980, Ser. No. 131,128**

**Claims priority, application Fed. Rep. of Germany, Apr. 4, 1979, 2913440**

**Int. Cl.³ B22D *11/00***

**U.S. Cl. 164—448** **7 Claims**

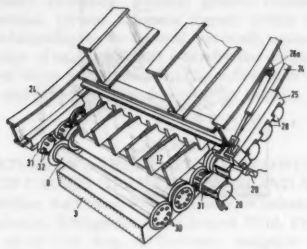
1. An apparatus for guiding and supporting a continuously cast slab, the combination comprising

a support surface;

a plurality of rolls disposed on said support surface in freely rolling completely unjournaled relation with respect to

said support surface and each other to travel in a direction along said support surface and to guide a slab therealong, each said roll having an axis of rotation perpendicular to the direction of travel along said support surface;

a pair of rails, each said rail being disposed along one respective side of said support surface running in the direction of travel of said rolls;



a plurality of slides, each said slide being slidably mounted on a respective rail; and

a plurality of drive motors, each said drive motor being mounted on a respective slide for selective coupling with a respective roll to drive said roll in said direction.

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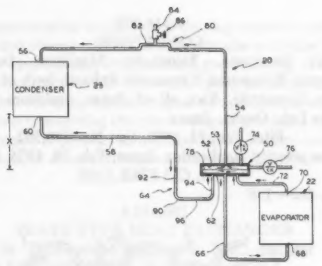
**4,314,601**

## HEAT EXCHANGE SYSTEM FOR RECYCLING WASTE HEAT

**Anthony A. Giuffre, and Anthony F. Giuffre, both of 4344 N. 70th St., Milwaukee, Wis. 53216**

**Filed Oct. 4, 1978, Ser. No. 948,392**
**Int. Cl.³ F28D *15/00***
**U.S. Cl. 165—1** **13 Claims**




10. The method of supplying heat to a fluid at a predetermined site from a point remote from said site, said method comprising:

establishing a closed circuit heat generated refrigerant convection flow type refrigeration system including an evaporator, a condenser in heat transfer relation with the fluid at a level above that of the evaporator, a refrigerant receiver at a horizontal level that is adjacent and above the horizontal level of the evaporator and that is below the horizontal level of the condenser, outflow conduit means communicating between the receiver and the condenser for conducting heat charged vapor phase refrigerant from the receiver to the condenser, return conduit means for communicating under gravity heat depleted liquid phase refrigerant from the condenser to the receiver, and recycle conduit means connecting the receiver with the evaporator for recirculating refrigerant therebetween,

charging said system with a halogenated hydrocarbon type refrigerant to establish the liquid level of the refrigerant within the receiver and sealing the system,

establishing a source of heat in heat transfer relation relative to the evaporator,

utilizing the heat transferred to the refrigerant at the evaporator from said heat source, forming the heat input to said system, as the motivating means to freely cycle by convection the refrigerant through the system free of mechanical pumping action on the refrigerant, while continuously convection flow circulating a liquid phase portion of the refrigerant between the receiver and the evaporator below the receiver liquid refrigerant leavel for effecting forced flow of the refrigerant through the evaporator and a carrying with such refrigerant flow of the vapor phase refrigerant to the liquid refrigerant in the receiver for rising through the liquid refrigerant in same to and through said reciver liquid level, and maintaining the refrigerant liquid level in the receiver at a level that is above the evaporator and below the condenser,

and recycling the refrigerant through said system using said utilizing and convection flow circulation steps while maintaining said source of heat.

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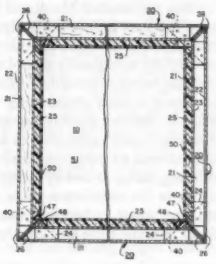
**4,314,602**

## KNOCK-DOWN HEAT STORAGE TANK

**Larry D. Frederick, and Richard E. Somers, both of Huntsville, Ala., assignors to Solar Unlimited, Inc., Huntsville, Ala.**

**Filed Aug. 25, 1980, Ser. No. 181,309**
**Int. Cl.³ F28D *1/06, 15/00***
**U.S. Cl. 165—10** **9 Claims**



1. A knock-down tank for containing a liquid medium, comprising:

a disassemblable rigid container having a bottom panel, with an inner wall, separate upright side-wall panels having inner walls and upper edges and having lower edges which rest on the bottom panel and having side edges in mutually abutting relationship, and having a top panel overlying said upper edges and closing the container, and having releasable fastener means extending inwardly of the container from the side-wall panels in the vicinity of their abutting side edges and releasably coupled together inside the container to hold the side panels together, the top panel having a hole extending downwardly therethrough;

rigid sheets of heat insulating material disposed against the inner walls of the bottom and side panels and having sufficient thickness to cover and conceal said releasable fastener means which extend inwardly of the container;

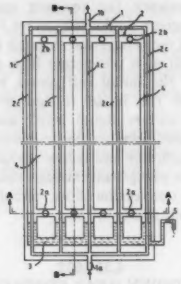
a liquid-containing flexible liner having side walls fitting snuggly within said side panels and having a bottom wall supported by said bottom panel, the walls of the liner lying against said sheets of insulating material and having peripheral flange portions extending outwardly from said side walls and overlying the upper edges of said side panels beneath said top panel; and

a dip tube assembly extending downwardly into the liner through the hole in the top panel and supported by the top panel the dip tube assembly providing access to the liquid in the liner.

## 4,314,603
## SYSTEM FOR DRYING HUMID AIR

Anders D. Backlund, Holmer, S-820 90 Ytterhogdal, Sweden

Filed Jun. 20, 1979, Ser. No. 50,243
Claims priority, application Sweden, Jun. 22, 1978, 7807188
Int. Cl.³ F28B 9/08
U.S. Cl. 165—57 5 Claims



1. A system for drying humid air to be used for ventilating a space, said system comprising:

a solid module block forming at least part of the outer walls and roof of a structure enclosing said space;

a ventilating conduit system, for supplying air to said space, embedded within the module block and having a plurality of air carrying sections defining ventilation paths;

a coolant conduit system having a plurality of sections connected in parallel for circulating a cooling fluid, the cooling fluid sections being disposed within the air carrying sections and being in heat exchanging relationship with the air flowing in the air carrying sections; and,

means for collecting water embedded in said module block and connected to said air carrying sections so as to be out of said ventilating paths, whereby water vapor contained in the supply air in the ventilation paths will condense out and run into the water collecting means, accumulating therein without impeding the air flow through the ventilation paths.

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## 4,314,604
## APPARATUS FOR THE SEGREGATION OF WORN-OUT CLEANING BODIES

Josef Koller, Ziegeleiweg 26, 4006 Erkrath 2, Fed. Rep. of Germany

Filed Sep. 20, 1979, Ser. No. 77,229
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1978, 7828382[U]; Sep. 23, 1978, 7828404[U]
Int. Cl.³ F28G 1/00
U.S. Cl. 165—95 12 Claims

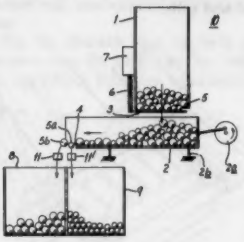
1. In an apparatus for the segragation of worn-out cleaning bodies formed of resiliently deformable material such as rubber or plastic and carried in the coolant fluid circuit of a heat exchanger, the improvement comprising,

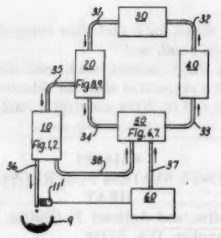
a diverter inserted into the circuit for the diversion of all the cleaning bodies to a device for sorting cleaning bodies by predetermined diameter limits,

said sorting device being disposed outside the coolant fluid circuit and including;

a branch pipe connecting said diverter with a feeding container to deliver the cleaning bodies to said feeding container;

a cleaning body separator disposed beneath said feeding container for receiving cleaning bodies therefrom and operable to separate reusable cleaning bodies having a greater than a predetermined cross-section dimension from those worn-out bodies having a smaller than predetermined cross-section dimension, said separator comprising a downwardly tapered trough having a vibrator to cause cleaning bodies to move therethrough, and a restricted opening portion formed of two spaced apart rails operable to separate the reuseable from the worn-out cleaning bodies by cross-section dimension, and





means to return the reuseable cleaning bodies to the coolant fluid circuit.

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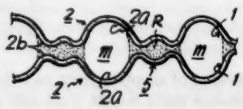
## 4,314,605
## CONDENSER

Hiroyuki Sumitomo, Takatsuki; Masafumi Doi, Daito; Kazuyuki Kobayashi; Katsutoshi Fukami, both of Nara, and Kenzo Kawanishi, Yao, all of Japan, assignors to Hisaka Works Ltd., Osaka, Japan

Filed Feb. 22, 1977, Ser. No. 770,562
Claims priority, application Japan, Feb. 28, 1976, 51-21553
Int. Cl.³ F28B 9/08
U.S. Cl. 165—110 1 Claim



1. A rectilinear plate type condenser construction comprising a pair of condenser elements placed in opposed relationship to one another, each of said condenser elements having a condensing and heat transmitting plate surface in opposed relationship to one another along which a steam condensate will flow in the form of a film, the plate surface of each condenser element having a plurality of laterally spaced longitudinally extending grooves therein thereby forming longitudinally extending valleys and ridges in alternating relationship to one another on the plate surface of each condenser element, said grooves being in substantially right angle relationship to the top of each of said plate elements, the longitudinally extending ridges of one condenser element being in longitudinal alignment with and at least in close opposed relationship to the longitudinally extending ridges of the other condenser element, thereby permitting the opposed valleys of each con-

denser element to form a plurality of vertically extending steam passageways in the condenser whereby the condensate in each formed vertically extending steam passageway is collected in the area at which each of the opposed ridges of the opposed condenser elements are in at least close engagement with one another, wherein each of the longitudinally extending ridges of each condenser element in opposed and at least close relationship to one another is each provided with a small, longitudinally extending, vertical groove thereby forming small, vertical, tubular channels therein which will run in parallel relationship to the formed, vertically extending steam passageways of said condenser whereby the condensate from the formed steam passageways will be collected in said tubular channels and will then flow downwardly therein.

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**4,314,606**

## APPARATUS FOR A TREATMENT OF FLOWING MEDIA WHICH CAUSES HEAT EXCHANGE AND MIXING

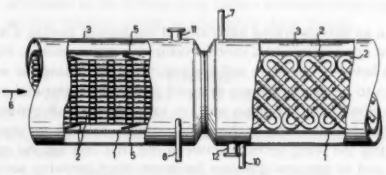
**Walter Müller, Kelkheim; Richard Gauer, Wiesbaden; Wilfried Walkenhorst, Königstein, and Gerhard Wild, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Sep. 10, 1979, Ser. No. 73,656**

**Claims priority, application Fed. Rep. of Germany, Sep. 12, 1978, 2839564**

**Int. Cl.³ F28D *7/08***

**U.S. Cl. 165—163** **10 Claims**



1. An apparatus for treatment of flowing media to cause heat exchange and mixing thereof, which includes a tubular housing and within said housing internal fittings consisting of a plurality of tubes each of which extends in the axial direction of the housing and contains elbow-shaped tube portions and other tube portions connecting the elbow-shaped portions, said tubes being arranged in parallel to one another, with the connecting tube portions of adjacent tubes crossing one another.

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**4,314,607**

## PLATE TYPE HEAT EXCHANGER

**Nicholas H. DesChamps, Whippany, N.J., assignor to DesChamps Laboratories, Inc., East Hanover, N.J.**

**Filed Nov. 14, 1979, Ser. No. 94,047**

**Int. Cl.³ F28F *3/10***

**U.S. Cl. 165—166** **15 Claims**

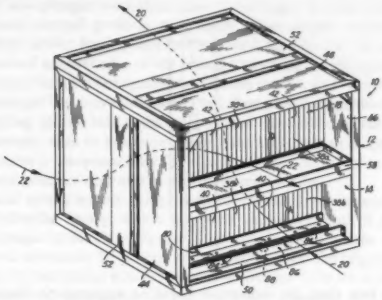
1. A heat exchanger for transmitting thermal energy from one moving body of fluid to another, comprising:

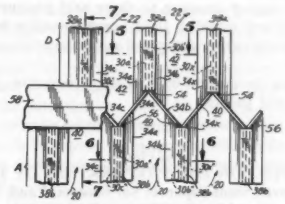
a housing defined by a pair of opposed side walls and opposed top and bottom walls and having first and second open ends; and

a thermal transfer core disposed within said housing including,

a continuous sheet of heat conductive material having first and second longitudinally extending edges, said sheet being folded upon itself in opposite directions alternately on fold regions which extend between said first and second ends of the housing and transversely to said longitudinally extending edges to define between said fold regions a plurality of substantially parallel, mutually spaced sheet protions, each sheet portion extending through said housing and having first and second terminal edge sections located in the regions of said first and second open ends, respectively, and wherein said fold regions comprise an upper set of fold regions located contiguous with said top housing wall and a lower set of fold regions located contiguous with said bottom housing wall, and,

wherein for substantially each sheet portion which is located between first and second sheet portions which are adjacent thereto, edge sealing means are provided for sealing upper and lower portions of the first edge section thereof to upper and lower portions of the respective first edge sections of said first and second adjacent sheet portions





respectively, and for sealing upper and lower portions of the second edge section thereof to upper and lower portions of the respective second edge sections of said second and first adjacent sheet portions respectively, whereby alternate pairs of adjacent sheet portions define first channels for flow of fluid moving through the exchanger and wherein the other alternate pairs of adjacent sheet portions define second channels for flow of fluid moving through the heat exchanger.

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**4,314,608**

## METHOD AND APPARATUS FOR WELL TREATING

**Charles N. Richardson, Overton, Tex., assignor to Tri-State Oil Tool Industries, Inc., Bossier City, La.**

**Continuation-in-part of Ser. No. 158,889, Jun. 12, 1980, abandoned. This application Aug. 19, 1980, Ser. No. 179,487**

**Int. Cl.³ E21B *23/02, 33/24, 43/26, 43/27***

**U.S. Cl. 166—250** **6 Claims**

1. A method for performing sequential operations on two vertically separated zones in a well bore comprising the steps of:

setting between the two said zones a packer having a fluid passageway extending vertically therethrough with a pressure shearable member closing the lower end thereof;

setting a retrievable fluid plug to close the upper end of said passageway to thereby insulate said pressure shearable member from well pressures in the zone above said packer;

performing the desired well treating operations in the zone above said packer;

equalizing the pressure differential across said retrievable plug;

removing said retrievable plug from the well bore;

running tubing into the well bore and sealably engaging said tubing with said fluid passageway through said packer;

establishing the fluid pressure in said tubing at a first desired pressure test level which is sufficient to test the fluid integrity of said tubing string and the fluid seal between said tubing string and said packer fluid passageway, but is

less than the minimum pressure required to shear said pressure shearable member at the lower end of said packer fluid passageway;

elevating the fluid pressure in said tubing string to a sufficiently higher pressure to shear said pressure shearable member and establish fluid communication between the bore of said tubing string and said zone below said packer; and,

performing the desired well treating operation on said zone below said packer.

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**4,314,609**

## APPARATUS FOR THE PREPARATION OF THE SOIL

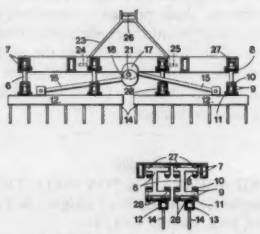
**Robert Chauvet, Saint-Saphorin Sur Morges, Vaud, Switzerland**

**Filed Mar. 5, 1980, Ser. No. 127,449**

**Claims priority, application Switzerland, Mar. 6, 1979, 2148/79**

**Int. Cl.³ A01B** *19/06*

**U.S. Cl. 172—54.5** **3 Claims**





1. Apparatus for preparation of the soil adapted to be attached to an agricultural tractor, comprising a frame, at least two rows of toothed bars (**12,13**) mounted on the frame in side by side relationship and at a right angle to the path of travel of said tractor, means for actuating said bars at one end, an eccentric (**17,20**) at the other end of said rods, a drive shaft (**21**) on which said eccentrics are fixed, said drive shaft adapted to be connected to the power take-off means of said tractor, characterized in that said eccentrics (**17,18**) which actuate one row of said bars (**12**) are displaced in a direction opposite to one another, said eccentrics (**19,20**) which actuate an adjacent row of said bars (**13**) are displaced in a manner relative to said eccentrics (**17,18**) actuating said first mentioned row of bars whereby said adjacent row of bars (**13**) are substantially at half-stroke while the first mentioned row of bars (**12**) is at the end of its stroke toward the outside or toward the inside of the path of travel, said bars (**12,13**) opposite one another in each of said rows of bars being displaced therefore during a portion of its travel in the same direction and during the other portion of its travel in an opposite direction, said toothed bars (**12,13**) each provided with movable supports (**6**), bearings (**27,28**) for each support, said bearing being of quadrangular transverse cross-section and mounted on resilient bands (**7,9**).

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**4,314,610**

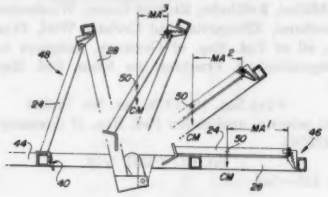
## FOLDABLE IMPLEMENT AND PIVOTAL BRACE THEREFOR

**Paul R. Riewerts, Port Byron, and David J. Wolak, Moline, both of Ill., assignors to Deere & Company, Moline, Ill.**

**Filed May 22, 1980, Ser. No. 152,260**

**Int. Cl.³ A01B** *73/00*

**U.S. Cl. 172—776** **9 Claims**



2. In an earthworking agricultural implement having a main section connectible to a mobile vehicle, a wing section, hinge means between the main and wing sections permitting the wing section to be swung from a first and generally horizontal position outboard of the main section to a second and generally elevated position above the main section, folding means for swinging the wing section between the first and second positions, and an improved means for supporting the wing section above the main section when it is in its second position comprising: an elongated brace member; pivot means connecting the brace member to the wing member for swinging movement, said pivot means being outboard of the hinge means when the wing section is in the first position; biasing means spatially separated from the folding means, said biasing means acting between the one end of said brace member and the wing section for swingably urging the other end of said brace member away from said wing section; and stop means between the wing section and brace member engageable to limit swinging movement of said member away from the wing section as said wing section is swung to its second position.

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**4,314,611**

## APPARATUS FOR SUPPORTING AND ROTATING A DOWN HOLE TUBULAR

**Clyde A. Willis, Wichita Falls, Tex., assignor to Walker-Neer Manufacturing Co., Inc., Wichita Falls, Tex.**

**Filed Jun. 11, 1980, Ser. No. 158,452**

**Int. Cl.³ E21B** *3/00;* **E21C** *7/10*

**U.S. Cl. 173—57** **23 Claims**

1. A drive apparatus for an earth boring apparatus including a derrick, said drive apparatus comprising:

a support member;

means for guiding the support member along the derrick such that the support member is substantially prevented from twisting with respect to the derrick;

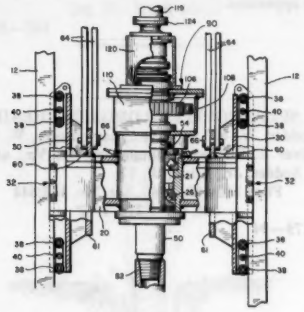
a shaft adapted for connection to a drill string to support the weight of the drill string;

first bearing means for supporting the shaft on the support member such that the shaft is rotatable with respect to the support member and the first bearing means accommodates a selected degree of skewness of the shaft with respect to the support member;

rotary drive means for rotating the shaft;

second bearing means for precisely aligning the rotary drive means on the shaft adjacent the support member; and

holding means for substantially preventing the rotary drive means from rotating with respect to the support member in a plane perpendicular to the longitudinal axis of the shaft;



said rotary drive means coupled to the holding means and the shaft such that the rotary drive means is movable relative to the support member and the rotary drive means is substantially free to follow lateral movement of the shaft as it turns in the first bearing means without subjecting the second bearing means to excessive skew forces.

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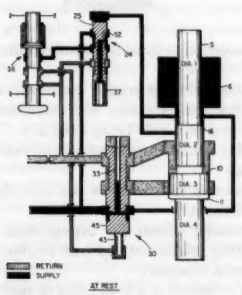
**4,314,612**

## HYDRAULIC LINEAR IMPACT TOOL

**David L. Thomas, and Donald J. Hackman, both of Columbus, Ohio, assignors to Battelle Development Corporation, Columbus, Ohio**

**Filed Jul. 20, 1978, Ser. No. 926,305**
**Int. Cl.³ B25D *9/18***
**U.S. Cl. 173—119** **5 Claims**



**1. A hydraulically-operated linear impact device comprising a body member having a longitudinal bore extending therethrough and a plunger supported in said bore, main valve means, trigger valve means, hydraulic fluid lines connecting said bore and valves with a source of hydraulic fluid, spring means acting near the upper end of said plunger and means for detachably mounting a tool member at the lower end of said body member wherein**

**a. said trigger valve means is mounted in said body member for movement between an actuating position and a rest position;**

**b. said plunger is supported for reciprocating movement in said bore between a first position in which said plunger compresses the spring means at the upper end of the body member and a second position at the lower end of the body member in which said plunger may impact a tool member, and wherein said plunger has enlarged diameter area (DIA. 3) intermediate its upper and lower ends forming a valved annular work area (11) for hydraulic fluid pressure acting to move said plunger upward against said spring means;**

**c. said main valve means having connections to said bore and to a high-pressure supply line and a lower-pressure return line for hydraulic fluid and being positionable, when the trigger is in actuating position, in response to a condition of said plunger such that when the plunger is in its downward second position said main valve means connects fluid under high pressure from said supply line to said valved annular area of the plunger to cause the plunger to be moved upward against said spring means, and when the plunger has moved to its upward, first position against said spring means, said main valve means connects said valved annular area to lower-pressure fluid such that said spring means is unopposed by high pressure and can then move said plunger downward on the impact stroke;**

**d. said spring means comprises a mechanical, pneumatic or hydraulic spring which acts near the upper end of said plunger to bias the plunger downward, and wherein**

**e. said hydraulic fluid lines are operable when the trigger is in the actuating position and said plunger is in its downward second position to provide a first fluid circuit from said high-pressure supply line to said main valve means for actuating the main valve means to connect fluid under high-pressure from said supply line to said valved annular area causing said plunger to be moved upward against said spring means and to compress said spring means, and**

**said hydraulic fluid lines are operable when said plunger is in its upward first position to provide a second fluid circuit from said lower-pressure return line to said main valve means for actuating the main valve means to connect said valved annular surface to lower-pressure fluid causing the plunger to be moved downward to impact the tool member due to said compressed spring means acting on said plunger.**

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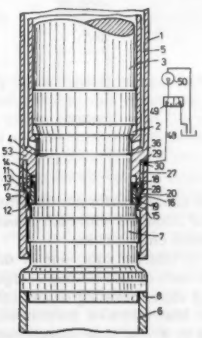
**4,314,613**

## PILE-DRIVING RECOIL DAMPING DEVICE

**Hans Kühn, Hamburg, Fed. Rep. of Germany, assignor to Koehring GmbH, Ellerau, Fed. Rep. of Germany**

**Continuation of Ser. No. 894,850, Apr. 10, 1978, Pat. No. 4,262,755. This application Sep. 8, 1980, Ser. No. 184,888**
**Claims priority, application Fed. Rep. of Germany, Apr. 15, 1977, 2716701**
**Int. Cl.³ B25D *17/06*; E02D *13/10***
**U.S. Cl. 173—131** **7 Claims**



**1. A pile driver which utilizes**

**a hollow, axially elongated housing having a substantially cylindrical wall and an open bottom end,**

a ram closely and slidably guided within the housing and axially reciprocatable therein along a path,

a ram follower slidably guided within the housing to execute limited axial movement and having

(a) an upper surface which can be struck by the ram

(b) a lower surface opposed to the upper surface, which lower surface can strike a pile to be driven and

(c) an outer support flange integrally formed on the ram follower and projecting radially outwardly of the upper surface, and

an inner support flange projecting radially inwardly from the wall of the housing between the outer support flange and the path, said inner support flange being axially opposed to said outer flange; and

at least one piston located between the support flanges, said at least one piston having a free end abutting on one of the support flanges and being slidably guided by another of the support flanges for limited axial movement parallel to the axis of the housing into and out of a corresponding closed compartment bounded by said another of the support flanges, which compartment is sealed by its corresponding piston, whereby compartment volume is reduced upon displacement of its corresponding piston towards said another of the support flanges; and

means for introducing and retaining a pressurized gas cushion within said compartment, which gas cushion urges the free end of said at least one corresponding piston against said one of the support flanges.

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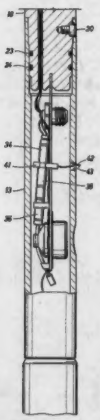
**4,314,614**

## METHOD AND APPARATUS FOR DISARMING AND ARMING EXPLOSIVE OIL WELL PERFORATORS

**William A. McPhee, and Timothy G. Golian, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.**

**Filed May 30, 1980, Ser. No. 154,652**
**Int. Cl.³ E21B *43/118***
**U.S. Cl. 175—4.56** **2 Claims**



1. A shaped charge perforator apparatus, comprising:

a plurality of chambers with each chamber containing one or more shaped charge units;

a plurality of blasting caps, one of said blasting caps provided for each of said shaped charge units;

said blasting caps consisting of an explosive charge section having a heat sensitive portion and an ignitor section separated by a void zone therebetween;

an interrupter means removably disposed within said void zone thereby isolating said ignitor section from said explosive charge section, said interrupter means being impregnated with ammonium acetate for operably desensitizing said heat sensitive portion of said explosive charge section when said interrupter means is so disposed; and

means for removing said interrupter means from said void zone having a lanyard attached to said interrupter and passing to the exterior of said chamber for removing said interrupter from said void zone to thereby arm said perforator apparatus.

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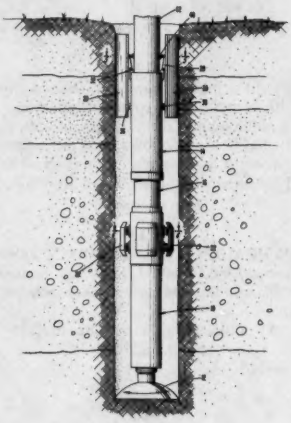
**4,314,615**

## SELF-PROPELLED DRILLING HEAD

**George Sodder, Jr., 607 4th Ave., Montgomery, W. Va. 25136, and Oliver E. Palmer, Montgomery, W. Va., assignors to George Sodder, Jr., Alloy, W. Va.**

**Filed May 28, 1980, Ser. No. 165,844**
**Int. Cl.³ E21B *4/02***
**U.S. Cl. 175—94** **16 Claims**



1. A self-propelled vertical downhole drilling head comprising:

a base section including gripper means mounted for longitudinally directed extension and retraction to selectively grip the wall of a hole being drilled,

first actuating means for extending and retracting said gripper means,

a drilling section mounted on said base for reciprocation relative thereto,

second actuating means for urging said drilling section downwardly relative to said base section when said gripper means is extended,

a cutter bit mounted at a lower end of said drilling section, and

third actuating means for rotating said cutter bit, comprising:

a first hydraulic motor having a first output shaft,

a second hydraulic motor spaced longitudinally and laterally from said first hydraulic motor and having a second output shaft extending parallel to said first output shaft,

a driven gear mounted at the end of each said output shaft,

drive transmitting gear means meshingly engaged on opposite sides by said driven gears,

first conduit means for supplying pressurized hydraulic fluid to said first and second motors,

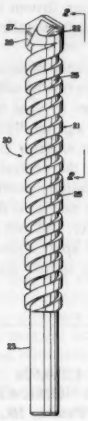
second conduit means for conducting hydraulic fluid from said first and second motors, and

power transmitting means operably connecting said drive transmitting gear to said cutter bit to rotate the latter.

## 4,314,616
## DIE-CAST MASONRY DRILL WITH LEADING HARD INSERT

James E. Rauckhorst, Geneva, and Thomas J. Skingle, Parma, both of Ohio, assignors to Acme-Cleveland Corporation, Highland Heights, Ohio

Filed Jan. 28, 1980, Ser. No. 116,225
Int. Cl.³ E21B 10/58
U.S. Cl. 175—394 8 Claims



1. A drill adapted for use in drilling masonry or other hard, brittle material, which comprises:

an axially elongated, generally cylindrical body having a leading front end portion and a rear end portion, said rear end portion adapted to be held by a tool holder, said body being formed of a die cast material and having at least one spiral groove cast in its exterior surface substantially along its length; and

a hard insert embedded in the leading end of said body, said insert being generally flat and extending generally diametrically across said leading end of said body, the sides of said insert having parallel planar side portions and a chisel edge across the top of said insert with leading cutting edges on either side of said chisel edge and a bottom edge on said insert opposite said cutting edges, said insert having means for interlocking with said body, said interlocking means comprising a pair of projections each extending from the plane of one of said flat side portions, each of said projections extending the greatest distance from the plane of said side portion near said bottom edge of said insert, said projections being in a contiguous relationship with said body and substantially surrounded by said body to retain said insert within said body without the addition of other securing material, the portion of each of said projections nearest said chisel edge being entirely covered with said die cast material of said body to form a secure interlocking relationship between said insert and said body.

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## 4,314,617
## STEERING APPARATUS FOR A HYDRAULICALLY DRIVEN VEHICLE

Masaaki Sakamoto, Kaga, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 27, 1980, Ser. No. 153,593
Claims priority, application Japan, May 25, 1979, 54/69422[U]
Int. Cl.³ B62D 11/04
U.S. Cl. 180—6.48 2 Claims

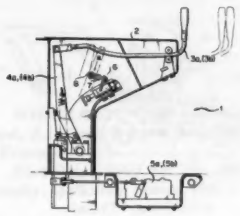
1. A steering apparatus for a hydraulically driven vehicle having a pair of independent hydrostatic transmissions, comprising:

a frame of the vehicle;

a pair of steering levers mounted for movement to said frame;

a pair of swivel levers pivotally mounted on said frame each being pivotally connected to said respective steering levers;

a pair of steering valve means each for controlling said



respective hydrostatic transmissions so that each hydrostatic transmission has forward and reverse positions and a stop position therebetween;

a pair of linkages each for operatively interconnecting said respective swivel levers and said steering valve means; and

means mounted on said frame for preventing said pair of swivel levers from being simultaneously pivoted to such a degree that both of said steering valve means are changed over to their reverse running positions.

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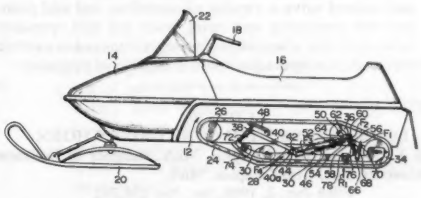
## 4,314,618
## SUSPENSION MECHANISM FOR TRACKED VEHICLES

Joji Tamura, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jan. 23, 1980, Ser. No. 114,694
Claims priority, application Japan, Jan. 25, 1979, 54/7387
Int. Cl.³ B62M 27/02
U.S. Cl. 180—193 8 Claims

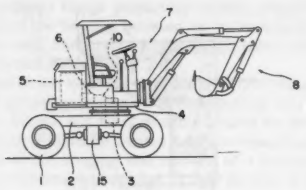


1. Vehicle including frame means, endless track means having front and rear end portions and upper and lower runs, power driven wheel means engaged with the endless track means at the front end portion thereof, slide rail means extending along and engaged with said lower run of the endless track means, suspension spring means including compression spring means and having one end connected with said slide rail means, first link means having one end pivotably connected with the frame means and the other end pivotably connected with the slide rail means, crank lever means mounted on said frame means for swingable movement about a pivot axis, said crank lever means having one end located above said pivot axis and connected with the other end of the suspension spring means, second link means having one end pivotably connected with the slide rail means at a pivot point, the other end of the crank lever means being located rearwardly of a line passing through the pivot axis and the pivot point and connected with the other end of the second link means.

## 4,314,619
## OPERATING DEVICE FOR SWIVEL WORKING VEHICLE

Keiro Tsuji, Osaka, Japan, assignor to Kubota, Ltd., Japan

Filed Aug. 17, 1979, Ser. No. 67,562
Claims priority, application Japan, Aug. 24, 1978, 53-116613[U]
Int. Cl.³ B60K 41/16
U.S. Cl. 180—327 3 Claims

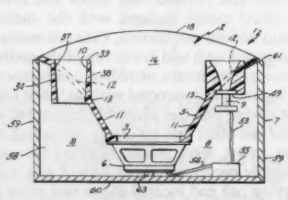


1. An operating device for a swivel working vehicle, comprising:
- a vehicle body;
- a rotary joint mounted to said vehicle body;
- a swivel base mounted to said rotary joint;
- a fluid pressure motor capable of rotation in forward and reverse directions;
- a control valve operatively connected to and capable of causing said fluid pressure motor to be rotated in the forward and reverse directions and of stopping said fluid pressure motor, said control valve being mounted to said swivel base;
- travelling means mounted to said vehicle body;
- speed change gears disposed between said fluid pressure motor and said travelling means;
- an operation valve for operating said speed change gears;
- a mechanical interlocking mechanism including a push-pull rod passing through the center portion of said rotary joint;
- a swing lever capable of being moved in two directions, said mechanical interlocking means including means operatively connecting said swing lever to said control valve such that when said swing lever is moved in one direction, said control valve is capable of operation, and said push-pull rod connecting said swing lever and said operation valve such that when said swing lever is moved in another direction, said operation valve is capable of operation.

## 4,314,620
## LOUDSPEAKER WITH CONE DRIVEN HORN

John T. Gollehon, Grand Rapids, Mich., assignor to Gollehon Industries, Inc., Grand Rapids, Mich.

Filed Jun. 2, 1980, Ser. No. 155,212
Int. Cl.³ H05K 5/00
U.S. Cl. 181—144 16 Claims

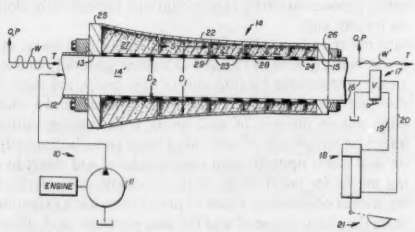


1. A full range loudspeaker, comprising:
- a radial horn having an open throat and a pair of outwardly curved side walls extending therefrom in a generally symmetrical relationship with a central axis of said horn to a mouth portion of said horn;
- a cone driven speaker mounted in the open throat of said horn and producing an audio response to an input signal;
- a base reflex enclosure having an open side in which said horn with attached speaker is mounted, and forming a single, open chamber between said horn and said enclosure;
- a compression driven speaker mounted in one of said curved horn side walls adjacent the mouth portion of said horn, and producing a separate audio response to another input signal; said compression driven speaker having a central axis oriented substantially parallel with the central axis of said horn; and
- a port disposed in the other of said curved horn side walls adjacent the mouth portion of said horn, and communicating with said chamber to vent back waves therein; said port being defined by a generally cylindrical sleeve having a central axis, and an exterior end protruding from said other horn side wall; the central axis of said port sleeve being oriented substantially parallel with the central axis of said horn, whereby said cone driven speaker, said compression driven speaker, and said port produce three separate, laterally spaced apart sound sources which propagate associated audio signals forwardly along generally parallel axes.

## 4,314,621
## FLUIDBORNE NOISE ATTENUATOR

Robert C. Hansen, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US79/00140, § 371 Date Mar. 7, 1979, § 102(e) Date Mar. 7, 1979, PCT Pub. No. WO80/01933, PCT Pub. Date Sep. 18, 1980
PCT Filed Mar. 7, 1979, Ser. No. 81,219
Int. Cl.³ F01N 1/04; F16L 55/02
U.S. Cl. 181—233 15 Claims



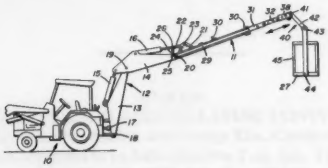

1. A hydraulic fluidborne noise attenuator (**14**) comprising
- a rigid, tubular outer casing (**22**),
- flow passage means (**14'**) for communicating hydraulic fluid through said attenuator (**14**), said flow passage means (**14'**) having an inlet (**13**) at a first end thereof and an outlet (**15**) at a second end thereof, and
- fluidborne noise means (**27**) for exhibiting a bulk modulus substantially greater than the bulk modulus of a gas and substantially less then the bulk modulus of said hydraulic fluid to attenuate noise levels at frequencies that vary over at least substantially the entire frequency range of from 100 to 5,000 Hz generated by flow and pressure fluctuations of said hydraulic fluid by tuning said fluidborne noise attenuator (**14**) to various portions of said entire frequency range, said fluidborne noise means (**27**) being at least generally tubular in shape and tapered downwardly at least approximately uniformly from said first end towards said second end of said attenuator with the diametrical size of said fluidborne noise means (**27**) being larger at said first end than at said second end.

**4,314,622**

## EXTENSION BOOM FOR TRACTORS HAVING BACK HOE ATTACHMENTS

**William W. Lindquist, 190 Clarencedale Ave., Youngstown, Ohio 44512**

**Filed Mar. 26, 1980, Ser. No. 134,189**
**Int. Cl.³ B66F *11/04***
**U.S. Cl. 182—2** **6 Claims**



1. An extension boom for use with a tractor having a back hoe assembly thereon wherein the back hoe assembly has a pair of arms pivoted to one another and wherein one of the arms is pivoted to the tractor and means on the tractor and the arms for moving the same relative to one another, the extension boom being pivotally attached to one of said arms so as to extend outwardly therefrom, said extension boom comprising a pair of elongated body members arranged in spaced parallel relation, a first tubular member secured to the elongated body members and extending outwardly beyond one end thereof, a secondary tubular body member telescopically mounted in said first tubular body member and means for securing said secondary tubular body member in desired relation to the first tubular body member, means on said boom for supporting an article to be moved, apertured attachment plates on said elongated body members located above the axial center line thereof and links selectively engaged in said apertures plates, power means on one of said arms and connected with said links whereby motion imparted by said power means to said apertured plates raises and lowers said boom extension relative to said arms of said back hoe assembly.

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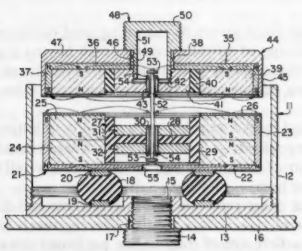
**4,314,623**

## VIBRATION ISOLATOR

**Masahito Kurokawa, Tokyo, Japan, assignor to Kokka Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 1, 1980, Ser. No. 117,737**
**Claims priority, application Japan, Feb. 2, 1979, 54-12556[U]**
**Int. Cl.³ F16F *7/00, 6/00***
**U.S. Cl. 188—267** **6 Claims**



1. A vibration isolator comprising an upper and a lower magnet assembly each magnetized in the vertical direction and formed with a central opening which extends vertically therethrough, the magnet assemblies being disposed coaxially on a common axis of the central opening so that their opposing surfaces present poles of a like polarity, a pair of yoke members of a magnetizable material disposed on the respective magnet assemblies so as to surround the side and the opposite surface from said opposing surfaces of the individual magnet assemblies, a pair of bearing members disposed in the central openings of the magnet assemblies and each formed with a through-opening in alignment with said axis, and a connecting shaft of magnetizable material loosely extending through the through-openings of the pair of bearing members and coupling one of the magnet assemblies to the other so as to be axially movable independently from each other.

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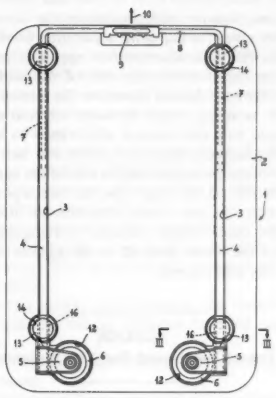
**4,314,624**

## WHEEL-MOUNTED LUGGAGE

**Paul F. Royet, Z.I. Nord, Avenue de la Roseraie, Pierrelatte (Drôme), France**

**Filed Oct. 2, 1980, Ser. No. 193,010**
**Claims priority, application France, Oct. 3, 1979, 79 25151**
**Int. Cl.³ A45C *5/14***
**U.S. Cl. 190—18 A** **7 Claims**



1. A piece of luggage comprising:

a case having a substantially flat bottom wall formed with

a pair of generally parallel, relatively narrow, and outwardly open elongated grooves having upper and lower groove ends,

a pair of longitudinally spaced, relatively wide, and outwardly open recesses at each groove between the ends thereof, and

a wheel cutout adjacent each lower groove end;

respective solid support blocks force-fitted in said recesses and each formed with a throughgoing passage aligned with the respective groove;

respective tubes extending longitudinally along said grooves through the respective passages and rotatable therein and having upper tube ends at said upper groove ends and lower tube ends at said lower groove ends;

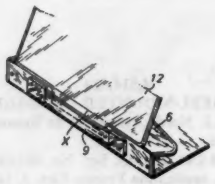
respective pivot mounts carried on said lower tube ends;

respective wheels journaled on said pivot mounts;

a handle connected to said upper tube ends and displaceable longitudinally relative thereto; and

means in said tubes between said handle and said pivot mounts for pivoting said mounts through about 90° between positions with said wheels in said cutouts and with said wheels standing up from said bottom wall on displacement of said handle longitudinally away from said upper tube ends.

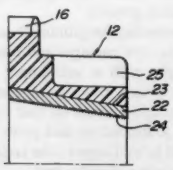
4,314,625
ARTIST'S PORTFOLIO
Abraham Sarna, Woodford, and David Sarna, London, both of England, assignors to A. Sarna & Son Limited, London, England
Filed Mar. 27, 1980, Ser. No. 134,413
Claims priority, application United Kingdom, Oct. 29, 1979, 37455/79
Int. Cl.³ A45C 11/00
U.S. Cl. 190—16 2 Claims




1. An artists' portfolio comprising two outer covers with one side of each cover joined so as to open and close book-fashion to form a case, closure means to secure the two adjacent free sides of each cover, a flap with a carrying handle being provided on the free side of one cover opposite the side thereof joined to the other cover, the side of the said other cover opposite to the side thereof joined to the one cover including a spine with securing means for sheet material and a support with a tongue on a side thereof which may be swung from a position lying between the covers when the case is closed to a position in which the tongue on the side of the support engages under the handle on the flap when the flap is positioned to lie generally over the one cover opposite to the side thereof joined to the other cover, whereby a triangular structure is formed with the sheet material to lie against either the flat support or the other cover.

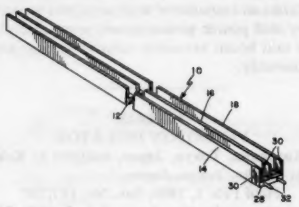
4,314,626
Patent Not Issued For This Number

4,314,627
SYNCHRONIZER RING FOR TRANSMISSION SYNCHROMESH DEVICE
Koji Nozawa, Higashikurume, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Jul. 25, 1979, Ser. No. 60,359
Claims priority, application Japan, Aug. 1, 1978, 53/93103
Int. Cl.³ F16D 23/06, 69/00
U.S. Cl. 192—53 F 2 Claims




1. A synchronizer ring for a transmission synchro-mesh device comprising: an annular inner body of a wear-resistant metal having an interior conical slide surface, and an annular outer body of a resilient resin integrally molded onto the outer surface of said inner body, the radial thickness of said inner body being small in comparison to that of said outer body.

4,314,628
FEED AND STORAGE TRACK FOR DIP DEVICES
Raymond E. Calbert, Escondido, and Herbert E. Morse, San Diego, both of Calif., assignors to Delta Design, Inc., San Diego, Calif.
Continuation of Ser. No. 942,060, Sep. 13, 1978, abandoned. This application Jul. 3, 1980, Ser. No. 165,785
Int. Cl.³ B65G 11/00
U.S. Cl. 193—2 R 5 Claims




1. Feed and track means for handling dual in-line packaged electronic devices of different widths, each having a generally rectangular shaped body with a plurality of electrical conductors extending downwardly from two opposite sides thereof, comprising:

an elongated track means having a plurality of longitudinally extending rails fixed in parallel spaced relation and including a pair of outer rails and an intermediate rail between the outer rails;

one of said outer rails and the intermediate rail forming a first pair of rails with a spacing therebetween to accommodate a first size of dual in-line packaged device straddling the first pair of rails;

the other outer rails and the intermediate rail forming a second pair of rails with a spacing therebetween to accommodate a second size of dual in-line packaged device straddling the second pair of rails;

the two outer rails forming a third pair of rails having a spacing therebetween for accommodating a third size of dual in-line packaged device straddling the third pair of rails;

said track having an input end;

and an input head adjustably mounted on said input end with guide means thereon for guiding dual in-line packaged devices onto a selected pair of rails.

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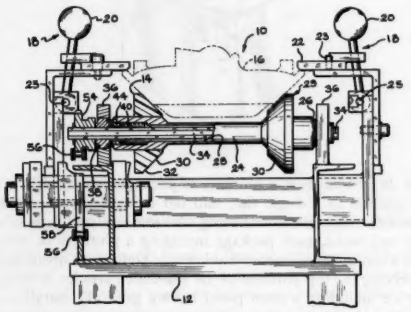
**4,314,629**
**POWER ROLLER ACCUMULATING CONVEYOR**
**Frank R. Shilander, Euclid, and Gyorgy Kiss, Chesterland, both of Ohio, assignors to La Salle Machine Tool, Inc., Troy, Mich.**
**Filed Dec. 31, 1979, Ser. No. 108,688**
**Int. Cl.³ B65G *45/02, 13/06***
**U.S. Cl. 198—500** **3 Claims**



1. A conveyor comprising a frame, a plurality of spaced apart power rollers positioned on said frame and operable to propel articles along said conveyor, each of said power rollers comprising a roller member terminating at opposite ends and having a longitudinal passageway extending between and through said ends, at least a portion of said passageway forming a radially inwardly facing cylindrical surface of substantially uniform diameter, drive means for imparting rotational movements to each of said power rollers, said drive means comprising a drive shaft rotatably mounted on said frame and extending through and beyond the ends of the passageway of an associated power roller, a friction drive member mounted on said drive shaft and positioned in said passageway portion, co-acting means on said drive shaft and on said friction drive member providing for the conjoint rotational movement of said drive shaft and said friction drive member, said friction drive member having a generally cylindrical outer surface of substantially uniform diameter which is sufficiently less than the diameter of said cylindrical surface in said passageway to provide for a space between the bottom sides of said cylindrical surfaces when the top sides thereof are in frictional engagement, said friction drive member being frictionally engaged with said roller member to transmit the rotational movement of said drive shaft to said roller member to propel the articles along said conveyor, said friction drive member being formed of a powdered metal and being impregnated with a lubricating agent enabling said friction drive member to slip in said passageway relative to said roller member when an article on said roller member is restrained from movement.

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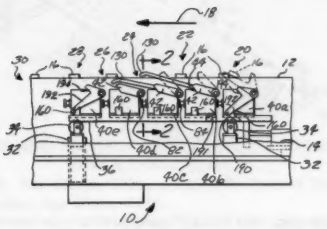
**4,314,630**
**ACCUMULATING CONVEYOR**
**Walter Greenwood, Jr., 505 Brentwood, Dearborn, Mich. 48124**
**Filed Feb. 25, 1980, Ser. No. 124,330**
**Int. Cl.³ B65G *25/00***
**U.S. Cl. 198—718** **12 Claims**



9. A conveyor module adapted for use in an accumulating conveyor of the type having a longitudinal frame with a plurality of spaced article support stations through which articles are advanced intermittently from a load to an unload station of said frame by reciprocal movement of said conveyor module,

said conveyor module comprising:

an enclosed housing:

means, carried externally by said housing, for sensing the presence of an article, said article sensing means adapted to sense the presence of an article in the adjacent advanced article support station;

article engaging means carried externally by said housing, said article engaging means being movable between a lowered inoperative position and an elevated article engaging position;

means, carried within said housing, for transferring said article engaging means between lowered and elevated positions;

means, carried within said housing, for actuating said transferring means;

said actuating means being responsive to said sensing means to position said transferring means in an operative condition when the adjacent advanced support station is empty to move said article engaging means to an elevated, article engaging position.

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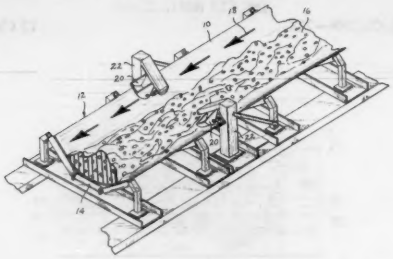
**4,314,631**
**FRICTIONAL BELT BRAKE**
**Enoch R. Hagerman, Ligonier, Ind., and Richard H. Walkden, Buchanan, Mich., assignors to Uniment Systems, Inc., South Bend, Ind.**
**Filed Feb. 22, 1980, Ser. No. 123,743**
**Int. Cl.³ B65G *43/06***
**U.S. Cl. 198—856** **5 Claims**

1. A brake device for a belt run having an upper surface, said device comprising a support surface and a wedge member spaced above said support surface, said support surface and said wedge member defining a path therebetween for movement of said belt run, means for directing said wedge member downwardly to compress said belt run against said support surface and into wedging motion-stopping contact with the belt run upper surface upon reverse movement of said belt run, and means associated with said directing means for permitting forward movement of said belt run without wedging contact of the wedge member, said directing means being a pivot part carrying said wedge member, said pivot part being shiftable about a pivot location above said support surface between upper and lower positions wherein said wedge member is

movable in an arc from a location spaced from said belt upper surface when said pivot part is in its upper position into a location in said wedging contact with the belt run upper surface when said pivot part is in its lower position, said means permitting forward movement of said belt run being a roller, a bracket journaling said roller and being pivotally connected to



said pivot part, said bracket being pivotal relative to the pivot part from a first position locating said roller adjacent said wedge member wherein the roller will ride upon said belt upper surface to locate said pivot part in its upper position and a second position locating said roller more remotely from said wedge member wherein said pivot part is shifted into its said lower position.

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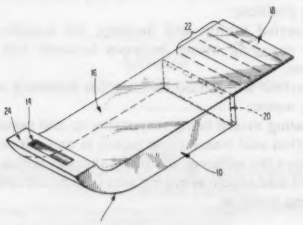
**4,314,632**

## INSERT FOR TILLS

**Richard T. Hutchinson, 109 Public Sq., Gallatin, Tenn. 37066**

**Filed Sep. 4, 1979, Ser. No. 72,262**
**Int. Cl.³ A45C *11/28***
**U.S. Cl. 206—0.81** **4 Claims**



1. An elongated till insert for quickly and reliably receiving selected currency deposited therein by a cashier, said insert securely and safely mating within a bill section of a cash register tray without defeating entirely the use of said section for the receipt of other currency, said insert comprising:

a first panel having a concave end portion and defining a top for said insert;

a second panel shorter than said first panel, and acting as a bottom of said till, said second panel having a similar concave geometry on one end to said first panel and being positioned under said first panel to lie in a parallel relationship thereto;

a third panel being shorter than all other panels and defining within its confines a frontal opening constituting a means for receiving, said third panel being positioned between said first and second panels at the concave extremities thereof;

fourth and fifth panels forming sides between said first and second panels, said sides adjoining said third panel and thus defining a receiving compartment having an opening at the end opposite said third panel;

positioning means located at the extremity of said first panel opposite said end having a concave configuration; and

a flap closure connected to said first panel so as to define a closure for said opening at the end opposite said third panel while being capable of flapping open only into said compartment for the purpose of removing the contents of said compartment;

said compartment adapted for the receipt of coins through said means for receiving and discharge of coins through said flap closure, said concave surface when mated to a bill section defining an open volume for the storage of bills.

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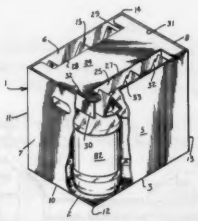
**4,314,633**

## STACKING DEVICE FOR TIERS OF ARTICLES

**James R. Oliff, Austell, Ga., assignor to The Mead Corporation, Dayton, Ohio**

**Filed Nov. 9, 1979, Ser. No. 92,989**
**Int. Cl.³ B65D *75/00***
**U.S. Cl. 206—148** **9 Claims**



1. In combination, a plurality of packages arranged in parallel relation in a single tier, said tier being disposed within a container, said container having a bottom wall and parallel side and end walls, each package including a plurality of articles and a top gripping carrier having side walls with openings for receiving the top portions of the associated articles, a stacking device including a main panel having generally parallel side edges and disposed in overlying relation to said packages, a pair of side panels foldably joined to the side edges of said main panel and folded downwardly and into said top openings, said main panel comprising an intermediate portion and at least one end portion, and said end portion being substantially equal to the corresponding horizontal dimension of said container.

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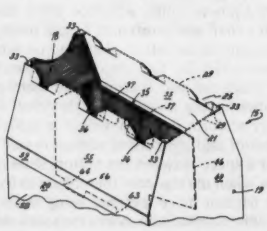
**4,314,634**

## RETURNABLE CONTAINER HAVING A CENTRAL PARTITION FORMING A RETURN HANDLE

**Orison W. Stone, New Haven, Vt., assignor to Pack Image, Inc., Middlebury, Vt.**

**Filed Mar. 3, 1980, Ser. No. 126,690**
**Int. Cl.³ B65D *5/02***
**U.S. Cl. 206—167** **15 Claims**



1. A returnable container for glass bottles and capable of being side loaded comprising,

a bottom wall,
end walls hinged to said bottom wall,
a top wall hinged to the end walls,
said bottom wall, top wall and end walls forming a tube having an axis through it,
a pair of lower side flaps hinged to said bottom wall,
a pair of upper side flaps hinged to said top wall,
a single thickness central partition extending between end walls in a plane transverse to the axis of the tube, said partition being connected to at least two of said end walls and bottom wall to form a handle suitable for carrying empty bottles after said top wall has been opened.

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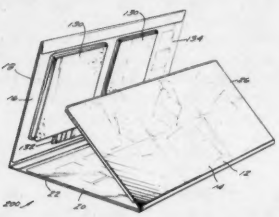
**4,314,635**

## CHECKING ACCOUNT CHECK AND CHECK BOOK ORDER-TAKING PORTFOLIO

**Robert Fraser; John Rouse, both of Baltimore; Robert C. Redic, and Suzanne Frock, both of Columbia, all of Md., assignors to Falconer Security Printers, London, England**

**Filed Aug. 29, 1980, Ser. No. 182,757**
**Int. Cl.³ B65D *73/00***
**U.S. Cl. 206—232** **12 Claims**



1. A checking account customer supplies-ordering portfolio, comprising:

a six rectangular panel blank of flexible sheet material having at least one face printed with indicia relating to checking account customer supplies, folded and zonally adhered to provide three composite panels integrally hinged together in a horizontally extending series comprising a central composite panel integrally hinged to a left-flanking composite panel and a right-flanking composite panel, with there being an integral hinge region comprising at least one respective vertical line fold between said central composite panel and each said flanking composite panel;

two of said composite panels, including said central composite panel and one of said flanking composite panels each comprising a respective two of said six rectangular panels of said blank folded over upon one another about a horizontal margin bend line common to both until back-to-back, with said printed face presented outwards; and adhesive means zonally applied between such two rectangular panels for adhering such two rectangular panels together; and

the remaining one of said flanking composite panels comprising a respective two rectangular panels of said blank folded over upon one another about margin bend line means common to both and including two bend lines, each common to a respective margin of a respective said rectangular panel and both common to a first depth-providing boxing panel, and two tab means integral with a respective two different ones of the margins of either of said respective two rectangular panels of said remaining flanking composite panel; each such tab means comprising a tab having a basal margin, a depth-providing boxing panel, and two bend lines including one common to the respective rectangular panel and the respective boxing panel, and another common to the respective tab basal margin and the respective boxing panel; both of the tabs being represented face to face against the opposite one of the two rectangular panels of said remaining flanking composite panel than the one to which the respective tab means is integrally appended; and adhesive means zonally applied between and adhering said tabs to the respective said opposite one of the two rectangular panels;

the three boxing panels being of substantially equal depth, so that there is provided a one margin open rectangular slip case with said printed face of said blank providing the exterior of said slip case and the opposite side of said blank from said printed face providing the interior of said slip case.

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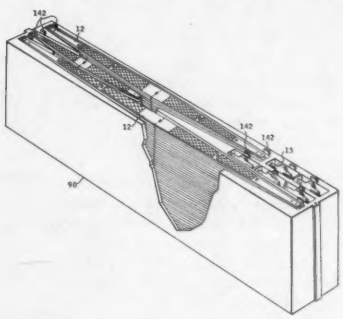
**4,314,636**

## DEVICE AND METHOD FOR ASSEMBLING LARGE SPACE STRUCTURES

**Paul Slysh, San Diego, Calif., assignor to General Dynamics Corporation, San Diego, Calif.**

**Division of Ser. No. 930,823, Aug. 3, 1978. This application Dec. 17, 1979, Ser. No. 104,504**
**Int. Cl.³ B65D *85/00***
**U.S. Cl. 206—321** **4 Claims**



1. A strut and node storage canister comprising:

a box structure having an open end and a base end opposite said open end;

a plurality of lead screws disposed within said box structure, each lead screw having a free end and a fixed end, said fixed end rotatably mounted in said base end of said box structure with said free end extending toward said open end;

a plurality of advance plates disposed within said box structure, each advance plate adapted for threaded engagement with at least one of said lead screws so that rotation of said lead screws in a first direction moves said advance plates toward said open end;

driving means connected to said fixed end of each of said lead screws for rotating said lead screws;

a dog fixedly attached to said free end of each of said lead screws to rotate with said lead screw;

each of said advance plates adapted to support a plurality of stacked struts for movement along said lead screws with said advance plates; and

said struts having keyways positioned to fit over said dogs and lead screws, said keyways being offset from one strut to the next through said strut stack;

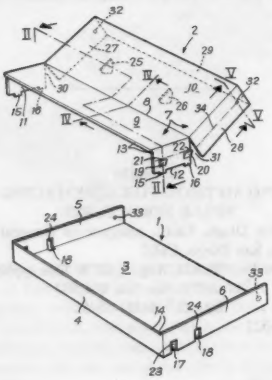
whereby as said lead screws are rotated in said first direction said advance plates and strut stacks are moved toward said open end and said dogs are brought into alignment with the keyways in the uppermost strut to permit individual sequential removal of struts from said stack.

4,314,637

## CASE FOR PACKING A TAPE CASSETTE OR THE LIKE

Patrick Posso, 10, avenue Jurigoz, Lausanne, Switzerland (CH-1006)

Filed May 7, 1980, Ser. No. 147,519
Claims priority, application France, May 14, 1979, 79 12220
Int. Cl.³ B65D *85/67, 43/16*
U.S. Cl. 206—387 5 Claims



1. A case for a tape cassette, comprising:

A. a substantially transparent bottom member formed in one piece and having
- (1) a bottom wall,
- (2) an upright rear wall,
- (3) opposite upright and parallel side walls,
- (4) at least one window in each of said side walls, near the rear wall and spaced therefrom and extending down to the bottom of the side wall, and
- (5) at least two shallow slots in said bottom wall, one at each side thereof, each opening outwardly to one of said windows;

B. a top member formed in one piece and having
- (1) a top wall,
- (2) a downwardly projecting front wall, and
- (3) opposite, parallel, downwardly projecting side walls spaced apart by a distance to be closely receivable between the side walls of the bottom member and each of which has a slit that extends through its full height and divides it into front and rear portions,
- (4) said top wall having a laterally extending groove aligned with said slits that provides a hinge whereby a front portion of the top member can swing up and down relative to the rear portion thereof;

C. integral means on the top member for securing the same to the bottom member, said integral means comprising
- (1) a tooth projecting sidewardly outwardly from each of said side wall rear portions and closely receivable in one of said windows, and
- (2) a tongue projecting edgewise downwardly from each of said side wall rear portions and closely receivable in one of said slots; and

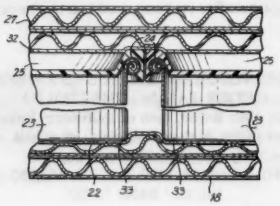
D. cooperating detent means on the side walls of said members for releasably confining the front portion of said top member against swinging out of a closed position, said detent means comprising a protuberance on each side wall of one of said members projecting towards the adjacent side wall of the other member and receivable in a depression in said adjacent side wall, said detent means being located near said front wall.

4,314,638

## SHIPPING CONTAINER DESIGNED TO PREVENT CAN DAMAGE DUE TO CHIME RIDE

Robert L. Gordon, Monroe, N.Y., and Paul Z. Wolak, Kingston, Mich., assignors to International Paper Company, New York, N.Y.

Filed Apr. 2, 1981, Ser. No. 250,452
Int. Cl.³ B65D *81/02, 65/00*
U.S. Cl. 206—427 2 Claims



1. A shipping container for a plurality of lidded, chimed cans, which comprises
- (a) hingedly connected pairs of side and end walls;
- (b) a bottom wall comprising a first pair of major flaps hingedly connected to the ends of the side walls and extending substantially perpendicular thereto and a first pair of minor flaps hingedly connected to the ends of the end wall and extending substantially perpendicular thereto and secured to the outer surfaces of the first pair of major flaps;
- (c) a lower corrugated pad positioned in abutting contact with the inner surfaces of the first pair of major flaps;
- (d) a plurality of lidded, chimed cans seated atop the corrugated pad;
- (e) a top wall comprising a second pair of major flaps hingedly connected to the side walls at their other ends and extending substantially perpendicular thereto and a second pair of minor flaps hingedly connected to the end walls at their other end and extending substantially perpendicular thereto and secured to the outer surfaces of the second pair of major flaps;
- (f) the interior height of said container being less than the combined height of a lidded, chimed can and the lower corrugated pad creating a compression fit whereby the combination of the corrugated pad and the first pair of major flaps forms a rigid platform which maintains the cans in an upright position while avoiding bottom wall sag, caused by horizontal movement of the cans relative to one another, and damage due to chime ride.

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4,314,639

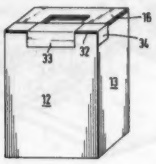
## FOLDING BOX CARRYING CONTAINER WITH ADHESIVE SEAL FOR CARRYING STANDING BOTTLES

Wolfgang Glöyer, Wiesenweg 51, D-2000 Oststeinbek, Fed. Rep. of Germany

Filed Feb. 20, 1980, Ser. No. 122,971
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1979, 7905025[U]; Oct. 24, 1979, 2942908
Int. Cl.³ B65D *5/46, 25/30*
U.S. Cl. 206—427 8 Claims

1. A carton blank cut and scored to permit folding and assembly as a carton for beverage bottles standing therein in rows, said blank comprising a one-piece cardboard member having score lines to define a first end wall portion, a first sidewall portion extending from one side of said first end wall portion, a second end wall extending from one side of said first sidewall portion, a second sidewall portion extending from one side of said second end wall portion, first and second transverse top wall portions extending respectively from a first end of each of the first and second end wall portions, first and

second longitudinal top wall portions extending respectively from a first end of each of the first and second sidewall portions, and a plurality of bottom wall portions extending respectively from a second end of separate ones of the end wall and sidewall portions; said score lines permitting folding of said carton blank to a position with said bottom wall portions defining a carton bottom, said first and second end wall portions extending in spaced parallel relation and said first and second sidewall portions extending in spaced parallel relation and cooperating with said first and second end wall portions to define a rectangular carton, and said first and second transverse top wall portions and first and second longitudinal top wall portions overlapping to provide a carton top of at least three layers; said first longitudinal top wall portion having a rectangular opening cut therethrough; said first and second




transverse top wall portions being cut so that in the folded carton position with said first longitudinal top wall portion overlying said first and second transverse top wall portions a rectangular opening exists through said transverse top wall portions substantially congruent with the first longitudinal top wall portion rectangular opening; said second longitudinal top wall portion being cut and scored to define a foldable rectangular flap capable in the folded carton position, with said second longitudinal top wall portion overlying said first longitudinal top wall portion, of folding around one longitudinal edge of the congruent rectangular openings to place a major portion of said flap in a plane parallel with the plane of said first longitudinal top wall portion; said major portion, when said carton is assembled, filled and closed, being held in said plane by a bottle within said carton.

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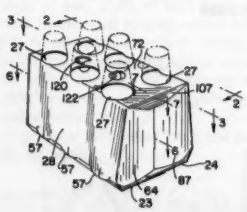
**4,314,640**

## BOTTLE PACKAGE

**Guelfo A. Manizza, Blauvelt, N.Y., assignor to Federal Paper Board Company, Inc., Montvale, N.J.**

**Filed May 13, 1980, Ser. No. 149,350**
**Int. Cl.³ B65D** *85/62, 75/08*
**U.S. Cl. 206—434** **12 Claims**




1. A carrier package comprising an assembly of articles, in the form of bottles, arranged in a double row and in transversely aligned pairs, enclosed in a tubular carton formed from a single blank of paperboard or similar foldable sheet material, said carton having a top wall panel, integrally hinged sidewall forming panels depending from side edges of said top wall panel and extending along the oppositely disposed outer side faces of the article assembly, bottom wall forming panels integrally hinged to the bottom edges of said sidewall panels and extending inwardly toward each other with overlapped margins, which margins of said bottom wall forming panels have cooperating means securing the panels together, end wall forming panels integrally hinged to the ends of said sidewall panels and said top wall panel which are disposed in end closing relation at opposite ends of the tubular carton, said top end wall panels being free of the sidewall panels and being hinged downwardly and inwardly to a position adjacent the top portions of the endmost pair of bottles, said side end wall panels having top edges tapered inwardly and downwardly and having top marginal portions overlying free marginal portions of said top end wall panels and said end wall panels hinged to said side wall panels having inner vertical margins disposed in overlapping relation and having dual latch means interengaged with each other and with said top end wall panel securing said panels in end closing position.

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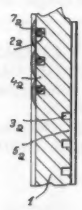
**4,314,641**

## RACK FOR FLEXIBLE SHAPES

**Henri Bronne, Monaco, Monaco, assignor to S.A.M. Silvatrim, Monaco, Monaco**

**Filed Sep. 14, 1979, Ser. No. 75,660**
**Claims priority, application France, Oct. 9, 1978, 78 29356**
**Int. Cl.³ B65D** *85/20*
**U.S. Cl. 206—443** **3 Claims**




1. A rack for holding elongated articles, comprising at least two assemblies of straight parallel coplanar grooves separated by ribs for receiving in the grooves straight portions of the articles to be held, the ribs and grooves of one assembly being disposed at an angle to those of the other assembly, the region between adjacent ends of the ribs of the two assemblies being free from ribs, said ribs and grooves being present on both sides of the rack, the orientation of the ribs and grooves on one side of the rack being the opposite of the ribs and grooves on the other side of the rack.

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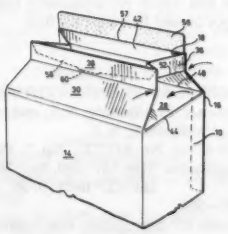
**4,314,642**

## CARDBOARD CONTAINER WITH RECLOSABLE TOP CLOSURE

**Leslie J. Dagostine, Quebec, Canada, assignor to Somerville Belkin Industries Limited, London, Canada**

**Filed Aug. 13, 1980, Ser. No. 177,573**
**Int. Cl.³ B65D** *5/54, 65/28*
**U.S. Cl. 206—621** **4 Claims**




1. A cardboard container comprising:

a tubular cardboard body with opposed side walls, opposed end walls, a bottom closure and a top closure;

said top closure being formed from panels at the upper end of each of said side walls and end walls of said tubular body, said panels being foldably connected to each other in series around the top of the container in the open condition;

each of said panels having a lip at its outer end;

the side panels on the side walls being foldable from the open condition in a downward direction to meet and form a top cover with their respective lips in abutting relation and extending upwardly; the end panels of the end walls being creased to fold upon themselves and underlie the side panels with their respective lips folded upon themselves and interposed between the lips of said side panels as said side panels move downwardly to form a top cover as aforesaid;

means for sealing the lips of said container when said side panels form a top cover as aforesaid;

the lip on the first one of said side panels having a reclosure tab hinged thereto, said reclosure tab being folded to lie in juxtaposed relation to the inner face thereof as the side panels form a top cover, but being hingeable as aforesaid to overlie the outer face of the lip on the second one of said side panels and function as a tongue;

the side panel on the second side wall being formed with means to admit said tongue to form a locked reclosure.

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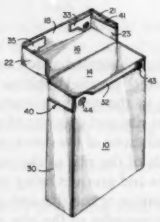
**4,314,643**

## FLIP TOP CARTON

**Hampton E. Forbes, Jr., Wilmington, Del., assignor to Westvaco Corporation, New York, N.Y.**

**Filed Oct. 27, 1980, Ser. No. 201,278**
**Int. Cl.³ B65D** *5/54*
**U.S. Cl. 206—626** **8 Claims**



4. A reclosable, flip top carton formed from a unitary blank of paperboard or the like including a receptacle portion comprising a front wall, bottom wall, side walls and a rear wall, and a flip top cover portion and cover portion locking means foldably attached respectively to the carton rear wall and front wall, the improvement wherein the cover portion locking means comprises a first locking flap having tapered outer edges centrally positioned along the upper edge of said front wall, and a pair of secondary locking flaps of abbreviated length that occupy the space along said front wall outboard of said first locking flap and which are detachably connected only to the tapered edges of said first locking flap.

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**4,314,644**

## ZIP SORT REGISTRATION SYSTEM

**Lester H. Stocker, Phillipsburg, N.J., assignor to Bell & Howell Company, Phillipsburg, N.J.**

**Continuation of Ser. No. 913,727, Jun. 7, 1978, abandoned. This application May 14, 1980, Ser. No. 149,615**
**Int. Cl.³ B07C** *5/00*
**U.S. Cl. 209—569** **9 Claims**

1. Apparatus for segregating into separate groups flat articles such as envelopes or documents bearing address blocks having at least one unique destination indicium associated therewith, all articles in each group having address blocks with the same unique destination indicium associated therewith, said apparatus comprising:

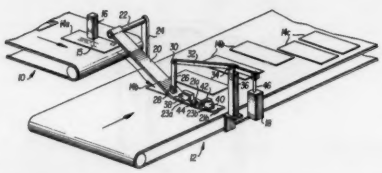
a discharge conveyor for conveying and discharging said flat articles along a first path;

indicating means for indicating the existence of said unique destination indicium for each of said flat articles before said flat article is discharged from said discharge conveyor;

a selection means;

tranmsitting means coupled to said indicating means for transmitting an action signal to said selection means in response to a change in said unique destination indicium;

laterally moving conveyor means;



said selection means including a movable portion articuately joined to a relatively stationary portion said movable portion being operative in response to said action signal to selectively move between a first position in engagement with said laterally moving conveyor means and a second position out of engagement with said laterally moving conveying means;

said movable portion being further operative, when in said first position, to engage said flat articles and change their direction to move said articles along a first lateral path on said lateral conveyor; and, said relatively stationary portion being operative, when said movable portion is in said second position, to engage said flat articles and change their direction to move along a second lateral path on said lateral conveyor means.

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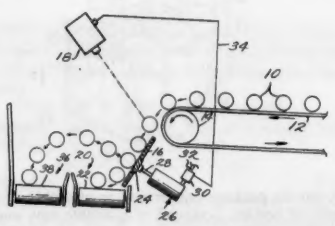
**4,314,645**

## MECHANICAL REJECTION SYSTEM FOR AUTOMATIC SORTING MACHINES

**Joseph R. Perkins, III, Roseville, and Sylvester L. Woodland, Sacramento, both of Calif., assignors to Sortex North America, Inc., Sacramento, Calif.**

**Filed Jan. 23, 1980, Ser. No. 114,669**
**Int. Cl.³ B07C** *5/00*
**U.S. Cl. 209—638** **7 Claims**



1. In an automatic sorter system wherein easily damaged delicate objects traveling along a path are scanned by optical-electronic sensor means to determine whether or not the object is acceptable or unacceptable, the combination of ejector means comprising:

means defining a generally planar, generally uninterrupted surface inclined to the horizontal along which scanned

objects move by gravity along a substantially free-fall path to a station for collecting acceptable objects;

means defining a separate section of said surface downstream of the scanning location, said section being movable outwardly of said surface to push an object opposed to said section out of said path to a station for collecting rejected objects, said surface and said path being arranged so that the distance between the objects in said path and said section is kept to a minimum, whereby rejected objects are subjected to minimum impact by said section to avoid damage thereto; and

means responsive to the sensor means for moving said section.

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**4,314,646**

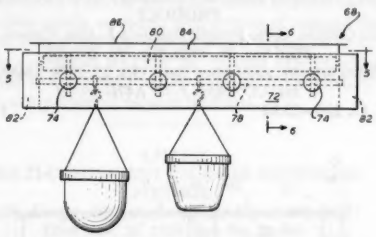
## DEVICES FOR SUPPORTING HANGING PLANTS

**Robert C. Purnell, Fishkill Park, Rte. 52, Fishkill, N.Y. 12524**

**Continuation of Ser. No. 812,255, Jul. 1, 1977, abandoned. This application Oct. 16, 1978, Ser. No. 952,246**

**Int. Cl.³ A47F *5/08***

**U.S. Cl. 211—113** **13 Claims**




1. A plant support of the type intended to be suspended in a horizontal plane from a horizontal or vertical surface and from which plant containers or other objects are suspended from hooks, said support comprising:

(a) at least one pair of rigid members having substantially planar surfaces parallel to one another;

(b) at least one rod-like member spaced from said rigid members so as to be capable of receiving thereon the hooks; said rigid members being substantially wider than and enclosing said rod, such that said rod is obscured from view by said rigid members with the plant container or other object in view; the ends of said rigid members being substantially in registry with one another;

(c) joining means, at least one of said joining means being secured to each of said ends of said rigid members to thereby define a frame; said joining means being secured perpendicularly to said planar surfaces of said rigid members at regular intervals therealong and at least one of said joining means being capable of receiving thereon the hooks, the hooks being obscured from view from any side of said suspended frame; and

(d) means for suspending said frame from the surfaces.

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**4,314,647**

## STORAGE AND DISPLAY ELEVATOR

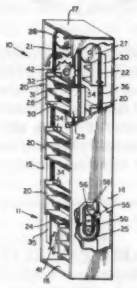
**Jack W. Harris, 1194 Houston Mill Rd. N.E., Atlanta, Ga. 30320, and Walter H. Eskew, Marietta, Ga., assignors to Jack W. Harris, Marietta, Ga.**

**Filed Jul. 1, 1980, Ser. No. 165,144**

**Int. Cl.³ A47F *3/11***

**U.S. Cl. 211—121** **8 Claims**

1. A storage and display elevator comprising a support frame, an upper pair of sprocket wheels mounted in said support frame in spaced coaxial relationship with respect to each other, a lower pair of sprocket wheels mounted in said support frame in spaced coaxial relationship with respect to each other and in vertical alignment with said upper pair of sprocket wheels, a pair of endless chains positioned in parallel planes and each extending about one of said upper and one of said lower sprocket wheels and each forming parallel upwardly extending chain flights, means for rotating said sprocket wheels and moving said chains in unison, a plurality of storage and display platforms connected to said chains in approximately equally spaced relationship along the lengths of said chains, said platforms including connecting rods extending therefrom and said connecting rods being attached to said endless chains whereby the platforms are pivotably suspended from said chains, guide rails supported by said support frame and extending vertically along the vertical runs of at least one of said endless chains, an upper guide sprocket positioned below an upper sprocket wheel and rotatable about an axis parallel to the axis of rotation of said upper pair of sprocket wheels, cam means positioned below said upper sprocket wheels and extending from said support frame beyond the plane of an adjacent endless chain toward the path of movement of said platforms and including arcuate entry cams positioned on opposite sides of said adjacent endless chain and an arcuate holding cam positioned inside the upwardly extending chain flights of said adjacent endless chain whereby gaps are formed between said entry cams and said holding cam for the



passage of the connecting rods of the platforms, said platforms each including a pair of guide means protruding laterally therefrom at a level below the connecting rod of the platform toward the plane of the adjacent endless chain for engagement with said guide rails, a first cam follower protruding laterally therefrom at a level above said pair of guide means, and a pair of cam followers protruding laterally therefrom on opposite sides of said first cam follower, whereby the guide means protruding from said platforms engage and move along a guide rail of one vertical run of an endless chain as the platforms are moved vertically, and as the platforms begin to move about the upper pair of sprocket wheels an arcuate entry cam engages one of the pair of cam followers and urges the pair of guide means into engagement with the upper guide sprocket, and as the platform continues its movement about the guide sprocket, the holding cam engages the first cam follower and maintains the pair of guide means in engagement with the upper guide sprocket, and then the other arcuate entry cam engages the other of the pair of cam followers and maintains the pair of guide means in engagement with the upper guide sprocket until the platform begins its downward vertical movement and the pair of guide means engage and follow the guide rail of the other vertical run of the endless chain.

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## GRAVITY FEED SHELF

**William S. Spamer, Roswell, Ga., assignor to The Mead Corporation, Dayton, Ohio**

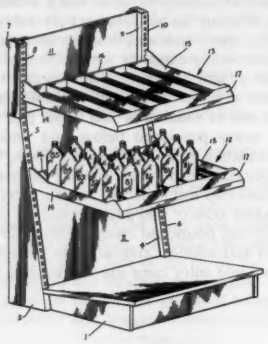
**Filed Nov. 30, 1979, Ser. No. 98,876**

**Int. Cl.³ A47F *1/00***

**U.S. Cl. 211—49 D** **14 Claims**

1. A gravity feed shelf comprising a substantially rigid sup-

port frame which is forwardly and downwardly inclined, front and rear support surfaces formed on the front and rear portions of said frame respectively, an intermediate support surface forming a part of said frame and disposed between said front and rear support surfaces and in substantial coincidence with an imaginary straight line interconnecting said front and rear support surfaces, an elongated chute mounted on said support frame with its ends in contact with said front and rear support



surfaces so that a row of articles disposed on said chute is automatically fed in the direction of inclination of said support frame upon removal of the leading article in the row, said chute being formed of semi-rigid yieldable material and being upwardly bowed somewhat in the absence of said row of articles and being substantially flat and with a part intermediate its ends in contact with said intermediate support surface when loaded.

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**STACKABLE PALLET COLLAR**

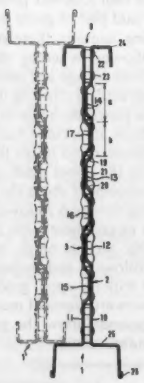
**Berthold Blomqvist, Växjövägen, S-360 30 Lammhult, Sweden**

**Filed May 9, 1980, Ser. No. 148,242**

**Claims priority, application Fed. Rep. of Germany, May 10, 1979, 7913519[U]**

**Int. Cl.³ B65D** *21/02, 6/22*

**U.S. Cl. 220—4 F** **7 Claims**



1. A stackable metallic pallet collar wherein the collar consists of four side sections arranged in opposite pairs joined by means of hinged joints so that they can be folded together to closed position, the side sections of each pair being of equal length and hinged at their ends to the side sections of the other pair to form a hollow rectangular frame when unfolded to open position, said hollow rectangular frame being capable of being stacked upon a frame formed by a like pallet collar, the side sections of each pair being a body of sheet metal having pressed-out portions providing a plurality of continuous longitudinal ribs in each side section spaced parallel to one another, and arranged and dimensioned in such a way that the longitudinal ribs of two adjacent side sections which are connected by a common hinged joint are staggered so that the ribs nest within one another in pairs when the side sections are folded together around said common hinged joint, said individual longitudinal ribs extending the entire length of the side sections from hinge to hinge, and including diagonal lateral flanks which level out into a base area running parallel to the plane of the side section body, the width of the longitudinal ribs inclusive the lateral flanks corresponding to the width of the area which is located between the longitudinal ribs, the upper and lower edges of said side sections being bent at right angles to the body and having means to enable the lower edge of the side sections of one pallet collar engage the upper edge of the side section of a like pallet collar in a tight fit.

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**4,314,650**

**PACKAGE COMPRISING A CREAMY CONFECTIONERY PRODUCT**

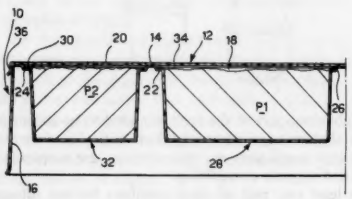
**Renzo Cillario, Corso Fratelli Bandiera 3, Alba (Cuneo), Italy**

**Filed Sep. 26, 1980, Ser. No. 191,205**

**Claims priority, application Italy, Oct. 25, 1979, 53683/79[U]**

**Int. Cl.³ B65D** *1/38;* **A47G** *19/00*

**U.S. Cl. 220—23.83** **1 Claim**




1. A food package comprising a base member having a flat horizontal circular wall having a plurality of apertures therein and a cylindrical supporting skirt depending from the circumference of said wall to support the latter in elevated relation with respect to a plane surface upon which the package may be placed, said apertured wall including a plurality of relatively small, circular apertures equally spaced in a circle about one relatively large centrally located aperture, a relatively large cup adapted to contain a food product being removably inserted into the large aperture and a plurality of relatively small cups adapted to contain related food products for use with the food product in said large cup being removably inserted into the respective small apertures, each of said cups having an external flange surrounding the mouth of said cup and an annular recess in said flat wall surrounding each of said apertures and having a depth substantially equal to the thickness of said flange whereby each cup disposed in an aperture is supported by its flange located in a respective annular recess and the flanges of the cups are flush with the horizontal circular wall of the base and further comprising a lid including a planar circular disc portion superimposed on and in contact with said horizontal circular wall of said base and the top of the flanges of each cup, and the lid further including a flanged circumferential relatively short skirt portion depending from said disc portion in frictional engagement with the upper circumferential portion of the skirt of said base the lower end of the skirt being flared outwardly whereby said lid removably covers the cups supported in each of said recess and isolates the contents of each cup from each other when the lid is installed and the package is moved from a horizontal position.

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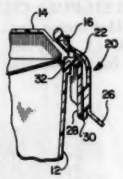
## FLEXIBLE PLASTIC CLOSURE MECHANISM AND CONTAINER

William R. Gaiser; E. Bryant Crutchfield, both of Dayton, and Harold D. Bartley, Springfield, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Oct. 31, 1980, Ser. No. 202,850
Int. Cl.[3] B65D *45/16*
U.S. Cl. 220—326 10 Claims



1. A lockable plastic closure mechanism comprising a first leaf including means adapted to engage a protrusion on a container cover, a second leaf connected to said first leaf by a first flexible axially extending web portion of reduced thickness, and a third leaf one edge of which is adapted to be secured to a container wall and the opposite edge of which is connected to said second leaf by a second flexible axially extending web portion of reduced thickness.

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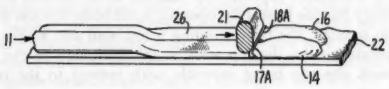
## MULTI-COMPONENT PACKAGE DISPENSING METHOD

Douglas E. Cooper, 3065 Argonaut, Rocklin, Calif. 95677

Filed Nov. 30, 1979, Ser. No. 98,863
Int. Cl.[3] B65D *35/22*
U.S. Cl. 222—1 2 Claims



1. The method of mixing and applying proportionate amounts of viscous components of a polymerizable adhesive, comprising the steps of

forming parallel tubes of non-resilient deformable material, with said tubes having substantially uniform and proportionate areas along their lengths,

placing one of said components in each of said tubes,

sealing the ends of said tubes to provide a protective package to keep said components separated and from contact with the atmosphere,

severing the sealed ends of said tubes from one end of said package,

simultaneously squeezing said tubes flat from a point a measured distance from said last named end of said package so as to express measured proportional quantities of said components from said last named end of said package while at the same time flattening said tubes over said distance,

depositing said proportional quantities of said components on a work surface as they are expressed from said package,

mixing said components together on said work surface utilizing said flattened end of said package from which said components were expelled,

and retaining a layer of the mixed components on the flattened ends of said tubes for further sealing in of their contents.

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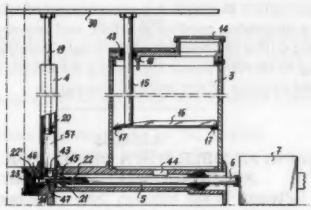
## MULTIPLE AUTOMATIC METERING DEVICE

Giuseppe Sindoni, Via Muratori 29, Milan, Italy

Filed Nov. 28, 1979, Ser. No. 98,030
Int. Cl.[3] G01F *11/14*; B01F *3/00*
U.S. Cl. 222—41 10 Claims



1. A multiple automatic metering device particularly suitable for metering and admixing paints, wherein there are provided a series of units each of which comprises a container and a metering head connected between each other by a communication chamber having therein interception means displaceable into one of two positions and a discharge conduit toward a single central collecting container, in each container and in each metering head there being provided stems operated by a single plate capable of reciprocating movement, acting simultaneously on all units, said stems being connected to mixing blades for the containers and to sealing gaskets for the metering heads, so that for one position of said interception means there is a flow of the product to be dosed from the container to the metering head and vice versa under the action of the plate capable of reciprocating movement and that for the other position of interception the metering means discharge directly through the discharge conduit, there being obstructed the communication toward the container.

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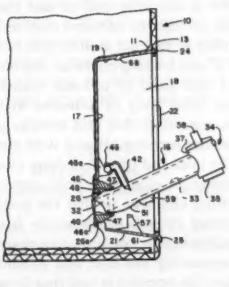
## BULK LIQUID CONTAINER HAVING A PIVOTABLE TAP

Rene J. Gaubert, 4219 Oakmore Rd., Oakland, Calif. 94602

Continuation-in-part of Ser. No. 116,475, Jan. 29, 1980, abandoned. This application May 5, 1980, Ser. No. 146,762
Int. Cl.[3] B67B *7/26*
U.S. Cl. 222—83 17 Claims



1. A dispensing assembly unit for use with a carton having a flexible plastic lining pouch, the pouch having a fitting bonded to one wall of the same, the fitting having an opening therethrough and a sealing membrane normally closing the opening, the membrane when disrupted permitting discharge of liquid within the pouch, the assembly unit comprising means forming a separate housing, a dispensing tap normally accommodated within the housing, means for attaching the housing to one side wall of the carton near the bottom of the same with the interior

of the housing being accessible from the exterior of the carton, the dispensing tap having a portion at one end of the same formed to pierce the sealing membrane when forced against the same and having a dispensing valve at the other end of the tap, the tap also having a flow passage for conveying liquid from said one end to the valve, and means for attaching the tap to said housing for swinging movement of the tap between a normal position in which it is accommodated within the housing to a dispensing position in which said one end of the tap is disposed within the opening of the pouch fitting and within the housing to thereby pierce the sealing membrane and the valve disposed exterior of the housing and carton.

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**4,314,655**

## SEALING MEMBER FOR A DEVICE FOR MELTING SOLID ADHESIVE MATERIAL

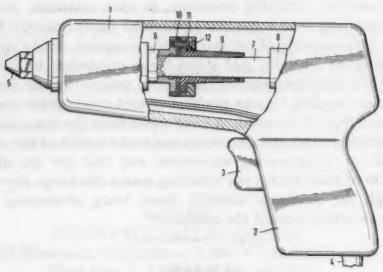
**Erich Leibhard; Erwin Schiefer, both of Munich, and Peter Stirnweiss, Maisach, all of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein**

**Filed Oct. 12, 1979, Ser. No. 84,103**

**Claims priority, application Fed. Rep. of Germany, Oct. 16, 1978, 2844932**

**Int. Cl.³ B67D *5/62***

**U.S. Cl. 222—146 HE** **5 Claims**



1. Device for melting a body of a solid thermoplastic adhesive material, and for providing for the dosed discharge of the molten material comprising a housing, a melting chamber located with and spaced inwardly from said housing, said melting chamber having an inlet end through which the adhesive material is supplied into said melting chamber, an annular gasket located at the inlet end of said melting chamber for effecting a seal around the adhesive material as it is fed into the melting chamber so that the molten material cannot leak out of the inlet end of said melting chamber, the interior of said gasket being shaped and sized to provide sealed contact with the surface of the solid body of adhesive material, wherein the improvement comprises that said annular gasket is an axially elongated tubular member aligned with and extending axially away from the inlet end of said melting chamber, said tubular member forming an elongated bore communicating directly into said melting chamber so that the body of thermoplastic adhesive material extends continuously from said gasket into said melting chamber an insulator ring positioned between and completely separating the inlet end of said melting chamber and said gasket, the opening in said ring forming a continuation of the bore in said gasket into said melting chamber, said insulator ring is formed of a thermostable poor heat conducting material for limiting the passage of heat from said melting chamber to said gasket, means in contact with said insulating ring for fixing said gasket to said inlet end of said melting chamber and said means is formed of a material for preventing a thermal bridge between said melting chamber and said annular gasket and including a screw member extending through said means in contact with insulating ring, said gasket, said insulator ring and said melting chamber for securing said gasket to said melting chamber.

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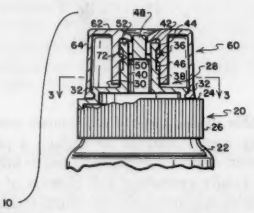
## CHILDPROOF PUSH-PULL CONTAINER CLOSURE

**Milton Kessler, 6690 Harrington Ave., Youngstown, Ohio 44512**

**Filed Nov. 1, 1979, Ser. No. 90,467**

**Int. Cl.³ B67D *5/32***

**U.S. Cl. 222—153** **18 Claims**



1. A protective closure for a container, the closure including a cap adapted to be displaced relative to the container to selectively permit or prevent the discharge of container contents from the container, cap displacement being permitted only in response to a deliberate distortion of the cap under the influence of forces greater than that which a child is capable of generating and/or in response to a sequence of cap movements which a child cannot accomplish, comprising:

(a) a body portion extending from the container, the body portion having an opening through which container contents may be discharged from the container;

(b) a protective cap, the cap adapted to be secured to the body portion to seal the opening in the body portion when so secured, the cap including a top wall and a skirt depending from the top wall, at the periphery of the top wall, the cap being movable with respect to the body portion;

(c) connecting means included as part of the body portion and the cap for permitting movement of the cap into and out of a sealing position atop the body portion, the connecting means being shielded from view by the cap, the connecting means including:

(i) a first locking portion carried by the body portion, the first locking portion extending from the body portion toward the skirt when the cap is in a container-closed position, the first locking portion including spaced recesses located near the periphery of the body portion, the recesses being radially outwardly directed; and,

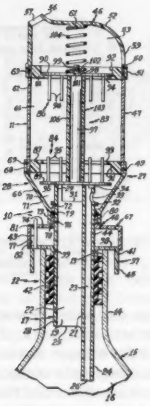
(ii) a second locking portion included as part of the cap, the second locking portion being located near the lower inner periphery of the skirt and including an annular, radially inwardly directed flange, the flange having a diametric extent such that a mechanical, interlocking fit with the recesses exists when the cap is in a container-closed position atop the body portion and the skirt must be acted upon in a deliberate manner to move the flange and recesses out of engagement with each other; and,

(d) the cap is formed of a relatively rigid, relatively friction-free material, the skirt being distortable under the influence of radially inwardly directed forces applied to the skirt at locations spaced 180 degrees from each other, whereby the flange will be moved outwardly with respect to the recesses to disengage the flange and recesses and thereby permit displacement of the cap to a container-open position.

## 4,314,657
## MEASURING DISPENSER

Mike Perakis, 1740 N. Atlantic Ave., Daytona, Fla. 32018, and Henry J. DeBenedictis, Ormand Beach, FL, assignors to Mike Perakis, Daytona Beach, Fla.

Filed Jun. 30, 1980, Ser. No. 164,595
Int. Cl.[3] G01F *11/28*
U.S. Cl. 222—162 21 Claims

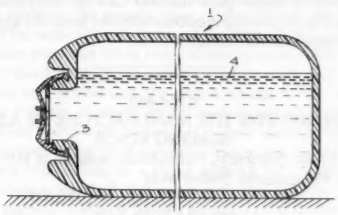


1. In a liquid measuring dispenser: a fixed assembly having a tube with a top portion and a bottom portion; abutment means on said top portion of said tube; external guide means on said tube spaced below said abutment means; attaching means secured and sealed to said tube between said top and bottom portions and immediately adjacent said external guide means adapted for securing and sealing said fixed assembly to a storage container with said tube extending through a pouring opening to locate said bottom portion in the storage container; air passage means and liquid passage means, each having an axial portion extending axially through said tube and a lateral portion extending between said abutment means and said external guide means respectively at the upper side and the lower side in inverted pouring position: a slidable assembly including a container with inlet and outlet ends having a central measuring chamber, a pouring chamber at said outlet end, and a connecting chamber at said inlet end surrounding said lateral portions of said air and liquid passage means in said tube; said container having a pouring hole at its lower side and an external air hole at said upper side connected to said pouring chamber; internal guide means secured and sealed to said container at said inlet end and axially slidably mounted on and sealed to said external guide means to mount said slidable assembly for limited axial sliding movement on and relative to said fixed assembly and a manual operator member attached to said container at said inlet end and projecting laterally outward for manually sliding said slidable assembly relative to said fixed assembly from a normal position toward said bottom portion of said tube to a dispensing position; valve means including an inlet valve between said connecting and measuring chambers and an outlet valve between said measuring and pouring chambers; said inlet valve and outlet valve respectively having an inlet seal and an outlet seal mounted and sealed on the inside of said container at the oppositely located inlet and outlet openings of said measuring chamber and an inlet disc and an outlet disc; rod and guide means connecting said inlet and outlet discs and maintaining alignment for seating with said respective inlet and outlet seals forming a disc assembly and spring means compressed between said container and disc assembly and coacting with said rod and guide means to maintain said discs in fixed spaced relation with said disc assembly normally abutting said abutment means to provide reaction for raising said slidable assembly away from said bottom end of said tube to normal position, closing said outlet valve and opening said inlet valve, to fill said measuring chamber when in inverted pouring position and on manually moving said manual operator member and slidable assembly toward said bottom end against the bias of said spring means to dispensing position closing said inlet valve and opening said outlet valve to pour a measured quantity of liquid when in inverted pouring position.

## 4,314,658
## VISCOUS PRODUCT DISPENSING SQUEEZE BOTTLE HAVING A SELF-VENTING AUTOMATIC SHUT-OFF VALVE

Robert H. Laauwe, 237 Green Ridge Rd., Franklin Lakes, N.J. 07417

Filed Jan. 30, 1980, Ser. No. 116,853
Int. Cl.[3] B05B *11/04*
U.S. Cl. 222—213 3 Claims



1. A viscous product dispensing package comprising a squeeze bottle made of elastic material and containing the viscous product, said bottle having a mouth provided with a dispensing valve that is elastically biased normally closed and opened by the pressure of said product when the product is displaced to the valve by squeezing and at least partially collapsing the bottle so as to dispense at least a portion of the product through the valve, elastic return of the bottle to its uncollapsed condition after said squeezing requiring the venting of air into the bottle to replace said portion of the product, said valve having at least one permanently open passage extending from the outside of the bottle to its inside and having a flow area related to the viscosities of air and said product so as to permit air to be sucked therethrough to permit said elastic return to the bottle and block gravitational flow of said product through the passage, said valve having a rigidly positioned rigid valve head having a periphery, and an elastically flexible diaphragm having a central opening with a periphery normally pressed on said periphery of the valve head by the elasticity of the diaphragm when the valve is in its normally closed condition, said passage being formed through said rigid valve head and the valve head having an outside exposed substantially directly to the ambient air outside of said valve.

## 4,314,659
## ROTARY VALVE

Earl P. Shapland, Sarasota, Fla., assignor to Flo-Con Systems, Inc., Champaign, Ill.

Continuation of Ser. No. 916,467, Jun. 19, 1978, abandoned. This application Jul. 7, 1980, Ser. No. 166,589
Int. Cl.[3] B22D *41/08*
U.S. Cl. 222—590 34 Claims

13. A top plate for a rotary gate valve comprising, in combination,

a metallic housing for containing the ceramic pieces,

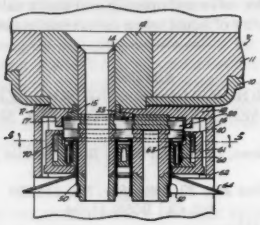
a formed ceramic plate having a centrally disposed semi-circular section for retaining a further ceramic member,

perforate ceramic member for insertion between said semi-circular sections,

said insertion member being a pouring member having a central aperture like teeming opening,

a mechanical interlock means for securing said pouring member between the ceramic plates,

each of said ceramic plates being identical in configuration,



whereby a single plate member can be employed with a variety of pouring members selected from the appropriate ceramic for the intended pour.

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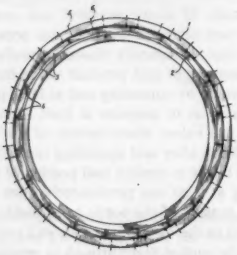
**4,314,660**

## METHOD FOR THE MANUFACTURE OF AXIAL SEALING RINGS

**Teunis Visser, Sliedrecht, Netherlands, assignor to IHC Holland N.V., Papendrecht, Netherlands**

**Filed Dec. 20, 1979, Ser. No. 105,529**
**Int. Cl.³ B23K *1/08***
**U.S. Cl. 228—140** **1 Claim**



1. Method for the manufacture of axial sealing rings from hard-metal blocks, said blocks being disposed in an annular groove of a carrier and being mutually secured and mounted therein by means of a solder, characterized in that in a bath filled with liquid solder, provided in the groove, the blocks are pressed against each other with their radial end faces in the direction of the circumference of the groove by means of radial clamp bolts before the solder sets.

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**4,314,661**

## HOMOGENEOUS, DUCTILE BRAZING FOILS

**Nicholas J. DeCristofaro, Chatham, N.J., and Peter Sexton, Weston, Conn., assignors to Allied Corporation, Morristown, N.J.**

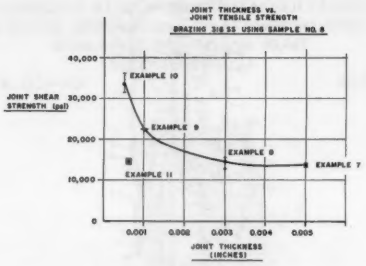
**Division of Ser. No. 68,266, Aug. 20, 1979, which is a continuation-in-part of Ser. No. 8,370, Feb. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 912,667, Jun. 5, 1978, Pat. No. 4,148,973, which is a continuation of Ser. No. 751,000, Dec. 15, 1976, abandoned. This application Apr. 9, 1981, Ser. No. 252,673**
**Int. Cl.³ B23K *35/30***
**U.S. Cl. 228—263 R** **3 Claims**

1. An improved process for joining together two or more metal parts which comprises:

(a) interposing a filler metal between the metal parts to form an assembly, the filler metal having a melting temperature less than that of any of the metal parts;

(b) heating the assembly to at least the melting temperature of the filler metal; and

(c) cooling the assembly, wherein the improvement comprises employing at least one homogeneous, ductile filler metal foil having a composition consisting essentially of about 0 to about 4 atom percent iron, 0 to about 21 atom




percent chromium, 0 to about 19 atom percent boron, 0 to about 12 atom percent silicon, 0 to about 22 atom percent phosphorous and the balance essentially nickel and incidental impurities, wherein the composition is such that the total of iron, chromium and nickel ranges from about 76 to 84 atom percent and the total of boron, phosphorous and silicon ranges from about 16 to 24 percent, said foil having a thickness less than about 0.0025 inch.

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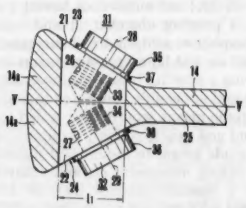
**4,314,662**

## SWINGING TYPE ROTORS OF CENTRIFUGAL MACHINES

**Tadahiro Uchida, Tokyo, Japan, assignor to Kabushiki Kaisha Kubota Seisakusho, Tokyo, Japan**

**Filed Sep. 22, 1980, Ser. No. 189,178**
**Claims priority, application Japan, Dec. 31, 1979, 54-183043**
**Int. Cl.³ B04B *9/12***
**U.S. Cl. 233—26** **6 Claims**

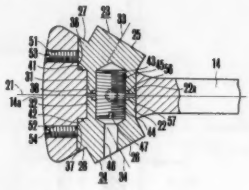


1. A swinging type rotor of a centrifugal machine comprising a plurality of radial arms equally spaced apart in the circumferential direction, each arm being provided with a through opening near an outer end thereof, said through opening extending at a right angle with respect to a longitudinal axis of said arm and to an axis of rotation of said rotor; a holding shaft fitted into said through opening, said through opening having a noncircular cross-sectional shape so as to prevent rotation of said holding shaft relative to said arm, opposite end surfaces of said holding shaft inclining away from said longitudinal axis of said arm; and a pair of trunnion pins threaded into said opposite end surfaces to hang buckets, and the directions of screw threads of said trunnion pins being selected such that threadings of said trunnion pins are tightened when said buckets are swung under centrifugal force to cause said trunnion pins to rotate.

## 4,314,663
## SWINGING TYPE ROTORS OF CENTRIFUGAL MACHINES

Yoshiichi Ouchi, Tokyo, Japan, assignor to Kabushiki Kaisha Kubota Seisakusho, Tokyo, Japan

Filed Sep. 22, 1980, Ser. No. 189,179
Claims priority, application Japan, Dec. 31, 1979, 54-183045
Int. Cl.³ B04B 9/12
U.S. Cl. 233—26 4 Claims



1. A swinging type rotor of a centrifugal machine comprising a plurality of radial arms equally spaced apart in the circumferential direction, each arm being provided with a through opening near an outer end thereof, said through opening extending at right angles with respect to a longitudinal axis of said arm and to an axis of rotation of said rotor; a pair of trunnion pins inserted into opposite ends of said through opening, said trunnion pins having cylindrical portions inclining towards said longitudinal axis of said arm and adapted to hang buckets and having flanges eccentric with respect to said through opening, portions of said trunion pins inserted into said through openings having cylindrical openings provided with oppositely directed screw threads; a threaded pin mating with the screw threads of said trunnion pins; at least one of said trunnion pins being provided with a tool inserting opening reaching one end of said threaded pin for inserting a tool for rotating the same; and the directions of said screw threads of said trunnion pins and those of said threaded pin being selected such that when the buckets are swung above said trunnion pins under centrifugal force threadings of said trunnion pins are tightened.

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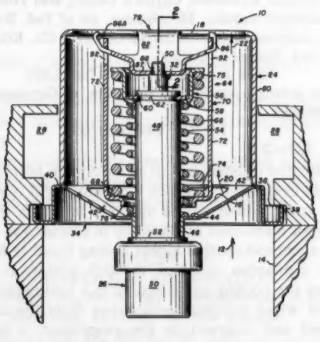
## 4,314,664
## THERMOSTAT ASSEMBLY

Thomas W. Wisyanski, c/o Century Brass Products, Inc., 59 Mill St., Waterbury, Conn. 06720

Filed Dec. 19, 1979, Ser. No. 105,235
Int. Cl.³ G05D 23/12
U.S. Cl. 236—34.5 8 Claims



1. A fluid thermostat comprising a fixed annular valve seat, a hollow open-ended shell movable toward and away from the valve seat and serving as a valve member for metering fluid flow between the shell and valve seat, the shell including a tubular sidewall and a web formed on one end of the sidewall, a thermally responsive actuator including a longitudinally extending piston guide, an axially reciprocable piston supported for movement in the piston guide and movable in a first direction for driving the shell in a corresponding direction away from the valve seat in response to fluid temperature increase, and a return spring assembly urging the shell in the opposite direction toward the valve seat, the return spring assembly including a bracket having a generally U shaped profile with spaced arms and an interconnecting annular base in symmetrical surrounding relation to the piston guide, and a return spring coaxially coiled about the piston guide with one end of the spring seated in fixed relation to the piston guide and the opposite end of the spring seated on the annular base of the bracket, the web of the shell having a center hub disposed between the bracket arms and coaxially supported on the piston in driving engagement therewith, the web center hub having a pair of diametrically opposed locking hooks, each of the bracket arms having a hook receiving opening in an end of the arm opposite the annular base of the bracket, the locking hooks of the web center hub extending through the openings of the bracket arms and being respectively reversely bent toward the other hook in engaged locking relation with their respective arms and connecting the return spring to the shell for effecting transfer of return spring load directly to the shell.

7. A fluid thermostat comprising a fixed annular valve seat, a hollow open-ended shell movable toward and away from the valve seat and serving as a valve member for metering fluid flow between the shell and valve seat, the shell including a tubular sidewall and web formed on one end of the sidewall, a thermally responsive actuator including an axially reciprocable piston, the actuator including a longitudinally extending piston guide supporting the piston for movement in the guide, the piston being movable in a first direction for driving the shell in a corresponding direction away from the valve seat in response to fluid temperature increase, and a return spring assembly urging the shell in the opposite direction toward the valve seat, the return spring assembly including a bracket having a generally U shaped profile with spaced arms and an interconnecting annular base in symmetrical surrounding relation to the piston guide and a return spring coaxially coiled about the piston guide, one end of the spring being seated in fixed relation to the piston guide and the opposite end of the spring being seated on the annular base of the bracket which serves as a return spring seat, the ends of the bracket arms opposite the annular base being directly connected to the web of the shell in fixed assembly therewith.

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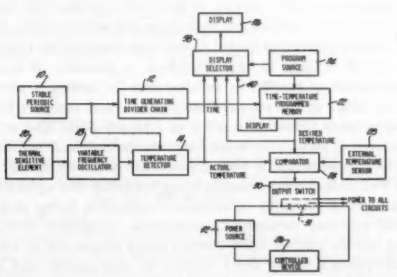
## 4,314,665
## ELECTRONIC THERMOSTAT

Michael R. Levine, 3605 Frederick Dr., Ann Arbor, Mich. 48105

Continuation of Ser. No. 778,376, Mar. 17, 1977, Pat. No. 4,206,872. This application Jan. 28, 1980, Ser. No. 116,064
Int. Cl.³ F23N 5/20
U.S. Cl. 236—46 R 14 Claims




1. A thermostat for controlling the application of electrical

power to a temperature modifying load, comprising: means for generating an electrical signal having a characteristic which varies as a function of the ambient temperature on the thermostat; a clock operative to generate digital electrical signals having values representative of real time over a repetitive cycle; a programmable, digital memory; means for loading said memory with a program of digital signals representative of desired temperatures for different times over said repetitive time cycle, circuitry for applying the output of the clock to the memory to generate a digital electric signal representative of the desired temperature at the instant time; means for receiving the electrical signal having a characteristic which is a function of ambient temperature and the output of the memory and for generating a control signal for said temperature modifying devices as a function of their differences.

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**4,314,666**

## ADJUSTABLE ELECTRONIC TEMPERATURE CONTROL, ESPECIALLY FOR REFRIGERATORS OR THE LIKE

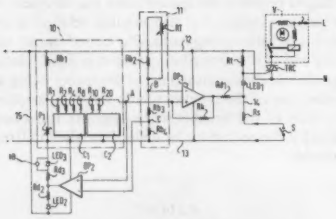
**Henno Schotten, Giengen, Fed. Rep. of Germany, assignor to Bosch-Siemens Hausgeräte GmbH, Munich, Fed. Rep. of Germany**

**Filed Sep. 26, 1979, Ser. No. 79,185**

**Claims priority, application Fed. Rep. of Germany, Sep. 26, 1978, 2841783**

**Int. Cl.³ G05D *15/00, 23/00***

**U.S. Cl. 236—78 R** **13 Claims**



1. Adjustable electronic temperature control, comprising a bridge circuit having arms and at least one diagonal connected between points of the bridge, a thermistor for sensing temperature connected in one of said arms, a control circuit to be activated by the temperature control, a circuit for activating an indicating and safety device, at least two amplifiers for switching said control circuit and indicating and safety circuit on and off, means connected in said at least one diagonal for supplying a control voltage to said amplifiers, a plurality of resistors connectible in parallel in another arm for setting a set-point temperature in the temperature control, said resistors having conductance values increasing in a binary code, and at least one coding switch for selectively connecting said resistors in parallel in accordance with given temperature steps, said coding switch including a handle being rotatable into a plurality of positions, a plurality of arcuate conductors being disposed along separate substantially concentric imaginary circles on said handle, and an open contact being connected to each of said resistors, being fixed relative to said handle and being closable by being placed in contact with one of said conductors, a given number of contacts being closed by said conductors in each of said positions of said handle.

**4,314,667**

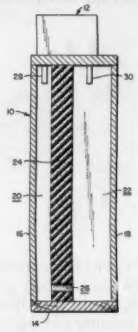
## THERMAL EXPANSION CHECK VALVE

**Harry W. Sigworth, Jr., Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Dec. 15, 1980, Ser. No. 216,577**

**Int. Cl.³ G05D *23/00***

**U.S. Cl. 236—93 R** **10 Claims**



9. A valve for a passive solar panel having a liquid thermosiphoning loop which comprises:

a housing having a lower port and an upper port;

a valve seat interposed between said ports;

a valve member movably disposed in said housing above the valve seat, which has a density greater than said liquid at or below the specified normal operating temperature and a density less than said liquid above the specified normal operating temperature, which valve member sealingly engages the valve seat to prevent the downward flow of liquid if the temperature is at or below the specified normal operating temperature as a result of the force of gravity, but disengages from the valve seat as a result of fluid pressures to permit the upward flow of liquid, and disengages from the valve seat a result of buoyant forces to permit the downward flow of liquid if the temperature is above the specifed normal operating temperature; and

guide means for receiving the unseated valve member.

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**4,314,668**

## METHOD OF HEATING WITH AN ABSORPTION HEAT PUMP

**Harald Jansen, Kelkheim; Gerhard Oelert, Bad Homburg, and Hans-Jurgen Kohnke, Holzminden, all of Fed. Rep. of Germany, assignors to Stiebel Eltron GmbH & Co., KG, Holzmindenl, Fed. Rep. of Germany**

**Filed Jan. 23, 1979, Ser. No. 5,897**

**Claims priority, application Fed. Rep. of Germany, Jan. 25, 1978, 2803118**

**Int. Cl.³ G05D *23/00***

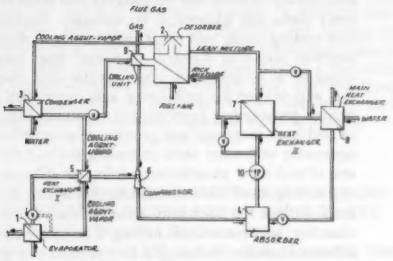
**U.S. Cl. 237—2 B** **4 Claims**

1. A method of heating with an absorption heat pump comprising an evaporator in which a cooling agent is evaporated by heat from outside air; an absorber in which the cooling agent vapor is absorbed adiabatically in a liquid lean mixture of cooling agent and another higher boiling liquid to form a rich mixture; a desorber in which the rich mixture is heated to evaporate the cooling agent and form a lean mixture; a condenser in which cooling agent vapor from the desorber is condensed and returned to the evaporator; a main heat-exchanger in which heat is given off from the lean mixture leaving the desorber; a secondary heat exchanger in which heat from the lean mixture leaving the desorber is transferred to the rich mixture leaving the absorber; a compressor located between the condenser and the absorber and a by-pass system

by which the secondary heat exchanger can be by-passed; said method comprising the steps of

maintaining the pressure of the absorber independently from the pressure of the evaporator by means of the compressor;

cooling the lean mixture returning to the absorber in the main heat exchanger to a lower temperature than in the secondary heat exchanger;




shutting off the flow of cooling agent from the desorber to the absorber when the pressure in the evaporator differs from a pre-determined value dependent on the outside temperature; and

by-passing the secondary heat exchanger thereby giving off heat exclusively via the main heat exchanger.

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**4,314,669**

## METHOD FOR SPRAYING POWDERED TO GRANULAR BULK MATERIAL

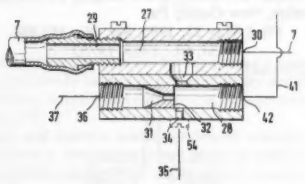
**Kurt Moos, Wil, Switzerland, assignor to Gema AG, Switzerland**

**Filed Nov. 13, 1979, Ser. No. 93,636**

**Claims priority, application Fed. Rep. of Germany, Nov. 14, 1978, 2849269**

**Int. Cl.³ B05D** *1/12*

**U.S. Cl. 239—1** **5 Claims**




1. A method of spraying powdered material, comprising the steps of:

mixing a stream of a propellant gas and a powdered material to form a powdered-material/gas mixture; spraying the mixture;

periodically diverting the flow of the mixture to terminate said spraying by means of suction; and terminating the diversion of the mixture to reinitiate spraying.

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**4,314,670**

## VARIABLE GAS ATOMIZATION

**William A. Walsh, Jr., 250 N. Bay St., Manchester, N.H. 03104**

**Filed Aug. 15, 1980, Ser. No. 178,503**

**Int. Cl.³ B05B** *7/06, 7/08*

**U.S. Cl. 239—11** **13 Claims**

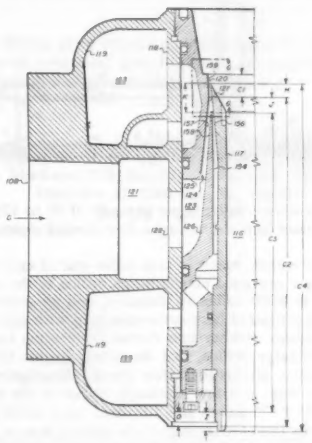
1. With gas atomizing nozzles, a method of controlling and varying the degree of atomization, the liquid flow rate, and the gas flow rate and resulting spray dilution by entrainment, comprising the following steps:

(a) forming a liquid stream so as to produce an unsupported liquid sheet;

(b) forming an atomizing gas stream so as to produce a gas sheet flowing adjacent to and in substantially the same direction as the unsupported liquid sheet in a region of atomization produced within a region of contact where said gas sheet becomes supported only by said liquid sheet on one broad surface;

(c) conducting said gas and liquid sheets in juxtaposition so that the region of atomization adjoins the zone of maximum mass flow rate of gas per unit cross-sectional area of the gas stream;

(d) adjustably controlling the maximum thickness of the unsupported liquid sheet in the region of atomization and, thereby controlling the droplet size of the spray;



(e) adjustably controlling the thickness of the atomizing gas sheet and, thereby, controlling the quantity of atomizing gas to produce the desired degree of atomization and amount of spray dilution by entrainment for a given liquid flow rate;

(f) controlling gas pressure supplying said gas stream so as to maintain a predetermined velocity of gas flow in said region of atomization;

(g) controlling the maximum liquid pressure supplying said liquid stream so that the unsupported liquid sheet flows at a velocity that is less than 15% said predetermined velocity in the region of atomization;

(h) directing the flow of a secondary gas stream so that it is entrained into the spray at the region of atomization to effect a smooth and immediate dilution of the spray with a minimum recirculation of droplets; and,

(i) determining the liquid capacity and gas consumption at a constant degree of atomization by proportion to the transverse dimension of the unsupported liquid sheet.

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**4,314,671**

## PRESSURE JET SPRAY APPARATUS

**Jack E. Briar, Box 55, Gardner, Kans. 66030**

**Continuation-in-part of Ser. No. 949,414, Oct. 10, 1978, abandoned. This application Dec. 17, 1979, Ser. No. 104,548**

**Int. Cl.³ B05B** *7/30, 7/06*

**U.S. Cl. 239—311** **8 Claims**

1. A pressure jet spray cleaning apparatus comprising:

(a) an elongate body member having a passageway longitudinally thereof for passing liquid under pressure and having an inlet end and an outlet end;

(b) a first nozzle means at said outlet end having a first restricted discharge orifice in the nature of 0.225 to 0.275

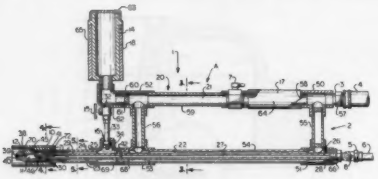
inches in diameter disposed concentrically of said passageway, said nozzle means having a tapered bore communicating with the passageway at the outlet end thereof and with surfaces thereof converging to said restricted orifice;

(c) means to connect said inlet end to a pressurized water supply source and having a flow control means therein;

(d) an elongate tube mounted concentrically in said passageway and spaced inwardly thereof whereby the water flow passageway is between the tube and body member, said tube having an air flow passageway therein with an inlet end and an outlet end;

(e) said water flow passageway having a cross-sectional area in the nature of one to three times the cross-sectional area of the air flow passageway;

(f) means to connect said tube inlet end to a pressurized air



supply source delivering a pressure of 50 to 125 pounds per square inch and having a flow control means therein; and

(g) an air nozzle means at said outlet end of said tube and having a restricted air discharge orifice in the nature of 0.060 to 0.080 inches in diameter, said air nozzle means having a tapered bore communicating with said air flow passageway with surfaces thereof converging toward the air discharge orifice, said air nozzle means having the respective discharge orifice spaced longitudinally upstream from said first discharge orifice in the nature of 0.900 to 1.375 inches and a tapered outer surface spaced inwardly from the surfaces of the tapered bore of said first nozzle means defining a venturi with air from the air nozzle mixing with and impelling water and air from the restricted discharge orifice of said first nozzle means.

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**4,314,672**

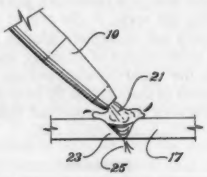
## BEVELING TIP

**Tommy J. Madewell, Argyle, and Ben F. Jezek, Jr., Tioga, both of Tex., assignors to Victor Equipment Co., Denton, Tex.**

**Continuation of Ser. No. 57,401, Jul. 13, 1979, abandoned. This application Sep. 22, 1980, Ser. No. 189,340**

**Int. Cl.³ B05B *7/06***

**U.S. Cl. 239—424** **3 Claims**



1. A cutting torch tip for cutting torch for beveling steel cuts comprising:

a. an inner piece having a plurality of grooves spaced equally around the periphery of its effluent end and extending toward its other end a sufficient distance to terminate in a chamber to which an admixture of preheat fuel and oxygen are supplied in operation; said inner piece having a plurality of longitudinally extending apertures for supplying the preheat fuel and oxygen; said inner piece being conformingly fitted at each end interiorly of an outer shell; said inner piece having a centrally disposed cutting oxygen passageway penetrating longitudinally therethrough; said cutting oxygen passageway having a diameter dco; said inner piece terminating in a squared effluent end and having its other end conformingly coengaging a longitudinally inner end of an outer shell and adapted to be sealingly received within the cutting torch;

b. an outer shell having a generally tubular configuration with an outer frusto conical section toward its effluent end, having its other end coengaging said other end of said inner piece and adapted to be sealingly received within said cutting torch; said outer shell having a chamber passageway larger in diameter than said inner piece therealong so as to define an outer annular said chamber for fuel and oxygen for preheating; said outer shell having a second passageway conformably receiving said first end of said inner piece and said grooves so as to define preheat apertures; said outer shell extending beyond the effluent end of said inner piece so as to define an effluent chamber and having an effluent aperture having an exit diameter de smaller than the upstream diameter du of said effluent chamber; said outer shell having a portion defining said effluent chamber including a first section at a first angle and defining a diameter du and having at least one frusto conical section converging radially inwardly toward said effluent aperture at a second angle greater than said first angle, said angles being measured with respect to longitudinal axis of said outer shell and being in the range of 0°–30°, inclusive, and making the transition from said effluent chamber diameter du to said effluent diameter de; said effluent chamber having a length L no greater than the effluent chamber diameter du; such that operationally said tip produces a bulbous flame that will satisfactorily smoothly cut steel at a bevel angle within the range of 45°–90° with respect to the perpendicular line at the line of beveling.

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**4,314,673**

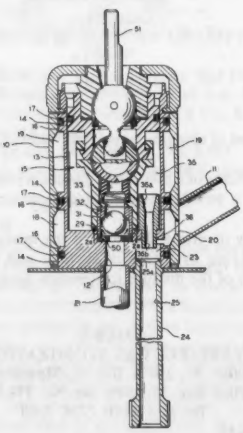
## MIXING FAUCET VALVE WITH DIVERTER AND STOP CHECK SYSTEM

**John Rudelick, Milwaukee, Wis., assignor to Universal-Rundle Corporation, New Castle, Pa.**

**Filed May 23, 1980, Ser. No. 152,880**

**Int. Cl.³ F16K *19/00***

**U.S. Cl. 239—443** **6 Claims**



1. An anti-syphoning mixing faucet valve comprising, an outer casing having an outlet communicating with a spout, a generally cylindrical body portion having a bottom wall defin-

ing a valve chamber and a discrete auxiliary chamber, said auxiliary chamber having a discharge opening communicating with said spout, said bottom wall having a pair of inlet passages each adapted to be connected to a liquid supply line, a check valve received in each of said inlet passages and adapted to close opposite to the direction of normal flow through said passages, a control valve received in said valve chamber and having a pair of inlet passages each communicating with a respective one of said bottom wall inlet passages, a nozzle in said body portion providing communication between said valve chamber and said auxiliary chamber, a Venturi tube communicating with said auxiliary chamber and having its mouth proximately spaced below and in substantial coaxial registration with said nozzle, a spray head having a manually operable valve connected to said Venturi tube, the flow from said nozzle passing directly into said Venturi tube and to said spray head when said manually operable valve is opened.

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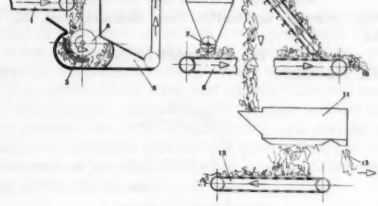
**4,314,674**

## PROCESS FOR SEPARATING THE PAPER FROM THE PLASTIC EXISTING IN THE URBAN SOLID WASTE

**Manlio Cerroni, Via Bruxelles, 53 Roma, Italy**

**Continuation of Ser. No. 52,457, Jun. 27, 1979, abandoned. This application Nov. 12, 1980, Ser. No. 205,897**
**Claims priority, application Italy, Jul. 10, 1978, 50220 A/78**
**Int. Cl.³ B02C *19/12***
**U.S. Cl. 241—14** **3 Claims**



1. A substantially dry process for separating a waste mixture comprising relatively large size pieces of paper and plastic film into its primary components for recycle, said process comprising the steps of:

triturating said mixture under conditions wherein the paper component is reduced to small particles while the plastic film remains substantially unchanged in size so as to provide differentially triturated waste;

subjecting the differentially triturated waste to a combing separation to recover the paper and plastic film as generally separate components; and

subjecting the recovered plastic film component to a screening separation to recover a substantially small paper particle-free plastic film component and a substantially plastic film-free small paper particle component.

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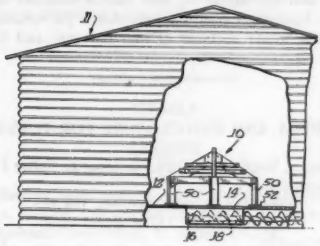
**4,314,675**

## GRAIN BIN DISCHARGE GUARD

**Rodney Grossman, New Paris, Ind., assignor to Brock Manufacturing, Inc., Milford, Ind.**

**Filed Jan. 7, 1980, Ser. No. 110,327**
**Int. Cl.³ B02C *18/00***
**U.S. Cl. 241—95** **19 Claims**

1. A guard apparatus for the discharge opening of a grain bin to preclude blockage of said opening by compacted grain or the like comprising: knife means including a plurality of knife units, each said knife unit defining a closed perimeter, and said knife units being concentrically arranged with respect to each other, each knife unit having a plurality of spaced apart blades adapted to be disposed over said discharge opening, said blades extending substantially perpendicularly to said discharge opening and having grain engaging cutting edges for cutting and breaking up compacted grain over said discharge opening to enable free flow of grain through said opening.



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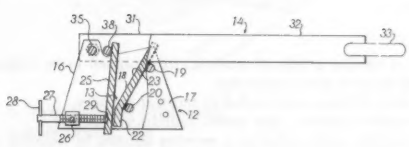
**4,314,676**

## CRUSHING AND PULVERIZING APPARATUS

**Torry F. MacLean, P.O. Box 512, Trona, Calif. 93562**

**Filed Jan. 21, 1980, Ser. No. 114,119**
**Int. Cl.³ B02C *1/04***
**U.S. Cl. 241—169** **10 Claims**



1. Crushing and pulverizing apparatus including a base portion, a jaw portion and a force applying portion; said base portion including a pair of generally vertically disposed, spaced base members, said jaw portion being disposed between said base members of said base portion, said jaw portion including a fixed jaw member and a movable jaw member extending between said base members of said base portion, said fixed jaw member being fixed with respect to said base members, said fixed jaw member including a lower first section and an upper second section extending upwardly therefrom, said upper second section having a vertical dimension substantially larger than the vertical dimension of said lower first section, said lower first section being disposed at a slight angle to the vertical and said upper second section extending upwardly therefrom at an angle to the vertical substantially greater than the angle of said first section, said movable jaw member of said jaw portion being disposed adjacent said fixed jaw member, said movable jaw member being disposed at a slight angle to the vertical approximating that of the lower first section of said fixed jaw member, the lower section of said movable jaw member being disposed adjacent to the lower first section of said fixed jaw member, said lower section of said movable jaw member engaging means for adjusting the spacing between the lower sections of said movable jaw member and said fixed jaw member, said adjusting means being disposed between said base members and pivotally connected thereto, said force applying portion including a handle member disposed adjacent the upper sections of said base members and pivotally connected thereto, said handle member extending from said pivotal connection a substantial distance beyond said base portion, said movable jaw member being pivotally connected to said handle member adjacent the upper section of said movable jaw member, said pivotal connection between said movable jaw member and said handle member being spaced from said pivotal connection between said handle member and said base

members, whereby movement of said handle member downwardly toward a horizontal position provides a crushing action between the upper sections of said movable and fixed jaw members and movement of said handle member upwardly toward a horizontal position provides a pulverizing action between the lower sections of said movable and fixed jaw members.

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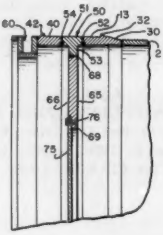
**4,314,677**

## JOURNAL AND END CLOSURE FOR TUBULAR VESSELS

**Bal K. Sareen, Northampton, Pa., assignor to Fuller Company, Bethlehem, Pa.**

**Filed Jun. 9, 1980, Ser. No. 158,025**
**Int. Cl.³ B02C *17/18*; B65D *8/08***
**U.S. Cl. 241—176** **10 Claims**




1. A tubular article of manufacture designed to be rotated about its own axis comprising:
- a first, hollow, open ended cylindrical member;
- a second, hollow, open ended cylindrical member;
- a hollow, open ended ring member secured by welding to said first and second cylindrical members intermediate and coaxially aligned with said first and second cylindrical members;
- said ring member having a projection extending circumferentially around its inside; and
- an annular plate secured by welding to the projection of said ring member;
- said projection having a length sufficiently long to permit the welded junction of said ring member and said annular plate to be positioned away from the area of highest cyclical hoop stress and radial stress when the rotary tubular article is rotated about its own axis.

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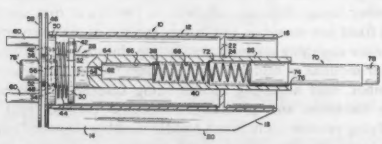
**4,314,678**

## APPARATUS FOR ROTATABLY SUPPORTING DEFORMABLE TUBULAR ROLLER BASE MEANS

**Lewis E. Upchurch, 204 S. Venus Ave., Clearwater, Fla. 33515**

**Filed Jun. 12, 1980, Ser. No. 147,935**
**Int. Cl.³ B65H *19/00***
**U.S. Cl. 242—55.2** **9 Claims**



1. An assembly for rotatably supporting deformable tubular roller means of differing diameters, comprising,
- a spindle means of generally tubular configuration and having a diameter less than the diameter of said tubular roller means,
- a plurality of at least two circumferentially spaced fin members projecting radially from said spindle means, said fin means extending at least a major portion of the length of said spindle means,
- each of said fin means tapered downwardly at one end thereof so that said tubular roller means can be easily slidingly inserted on said spindle means attendant deformation of said roller means if the inner diameter of said roller means is less than the diameter of an imaginery circle defined collectively by the outer edges of said circumferentially spaced fin means,
- an internal spring return mechanism for urging said fin-carrying spindle and hence said roller means into an equilibrium position when an external force is applied to said roller means to impart rotation thereto,
- said mechanism comprising an end plate means synchronously rotatable with said spindle means,
- said mechanism further comprising a longitudinally disposed first bias means having opposed first and second ends,
- said first end of said first bias means anchored to said end plate means,
- said second end of said first bias means anchored to a non-rotating means so that rotation of said deformable roller means and hence of said spindle means and hence of said end plate means operates to load said first bias means to the end that said first bias means returns said spindle to its equilibrium position when said external force effecting rotation of said spindle is removed.

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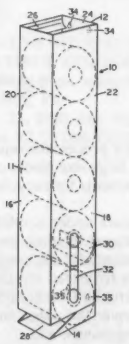
**4,314,679**

## ROLL HOLDER AND DISPENSER

**Dennis J. Paul, and Lloyd J. Speedy, both of Devonport, New Zealand**

**Filed Oct. 9, 1979, Ser. No. 83,153**
**Claims priority, application New Zealand, Oct. 12, 1979, 188643**
**Int. Cl.³ B65H *19/04***
**U.S. Cl. 242—55.3** **1 Claim**




1. A roll holder and dispenser comprising:
- (a) a container having a first aperature through which a roll can be inserted into said container and having a second smaller aperature through which a web of roll material can be withdrawn wherein;
- (b) said first aperature comprising the back side of said container, an inward retaining flange on said back side to retain the roll inside said container, hinging means on one side of said container to allow said container to be hinged to a wall allowing said container to swing away from the wall to expose said first aperature and to allow said container to swing back into the wall to block said first aperature, a locking means to keep said container in the closed position;
- (c) a roll impeding means for impeding the passage of a roll within said container towards the second aperature; and
- (d) a roll releasing means whereby a roll can be pushed

towards the second aperature against the urging of said impeding means.

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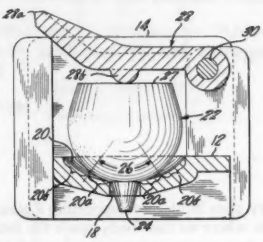
**4,314,680**

## INERTIA RESPONSIVE ACTUATING DEVICE FOR SAFETY BELT RETRACTORS

**Juichiro Takada, 3-12-1, Shinmachi; Setagayaku, Tokyo, Japan**

**Filed Jun. 20, 1980, Ser. No. 161,224**
**Int. Cl.³ A62B *35/02;* B65H *75/48***
**U.S. Cl. 242—107.4 A** **9 Claims**



1. In inertia responsive actuating device for safety belt retractors comprising a support having a substantially circular hole and an upwardly facing surface of revolution about the axis of the hole surrounding the hole and sloping upwardly in all directions from the hole, an inertia mass supported on the support and having a locating projection received in the hole and a spherical surface surrounding the projection and adapted to roll up the upwardly facing surface of the support in any direction in response to an inertial force on the mass, an actuator having a portion that engages an upwardly facing surface on the mass and is displaceable generally upwardly in response to rolling motion of the mass, and coacting cam and cam follower means on the upper surface of the mass and said portion of the actuator for vertically displacing said portion of the actuator by an amount substantially greater than the vertical displacement of the mass itself when it rolls up the upwardly facing surface of the support.

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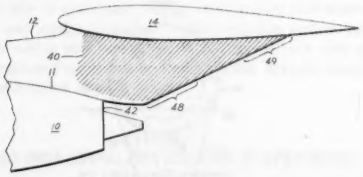
**4,314,681**

## DRAG-REDUCING COMPONENT

**John T. Kutney, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio**

**Filed Aug. 31, 1979, Ser. No. 71,524**
**Int. Cl.³ B64D *27/00;* B64C *21/10***
**U.S. Cl. 244—54** **8 Claims**



1. In an aircraft of the type having a wing-mounted gas turbine engine attached to a pylon that extends downward and forward of said wing, said pylon presenting an essentially narrow and aerodynamic forward profile with broad outwardly curved inboard and outboard surfaces forming tapered forward and aft ends on said pylon, an improvement comprising:

a modified nonaxisymmetric pylon contour, wherein the inboard surface of said pylon is provided with a broadly curved outward fairing added to existing pylon contour for the purpose of preventing surrounding ambient airflow from attaining supersonic velocities during subsonic aircraft flight conditions, and

wherein said fairing is positioned upon an aft region of said pylon from approximately a mid-span position on the pylon to a trailing edge of the pylon.

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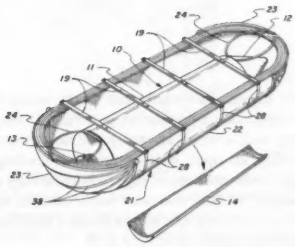
**4,314,682**

## DEPLOYABLE SHIELD

**Burton Barnett, Rossmore; Martin R. Kinsler, Los Angeles, and Lyle A. Nelson, Tarzana, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.**

**Filed Feb. 24, 1969, Ser. No. 802,306**
**Int. Cl.³ B64G *1/22, 1/52***
**U.S. Cl. 244—158 R** **9 Claims**



1. A combination comprising:

a space vehicle, and

a deployable shield at least partly surrounding said space vehicle, said shield comprising:

a plurality of curved ribs collectively defining an outside periphery of said shield, said ribs being temporarily deformable from a first deployed position spaced apart from said space vehicle to a second stowed position adjacent said space vehicle;

a plurality of flexible sheets connected to said ribs and spaced between said ribs and said space vehicle;

a plurality of springs tangentially mounted on said space vehicle and having an end of a rib connected to an end of each spring, said springs being temporarily elastically deformable from a first deployed position extending outwardly from said space vehicle to a second stowed position lying along a cylindrical surface of said space vehicle, said springs being pivotally connected to said space vehicle at a common pivot for deploying in the manner of a folding fan;

the ribs connected to said portion of springs having ends opposite to the ends connected to said springs pivotally mounted at a common pivot for deploying with said springs to form a surface having compound curvature;

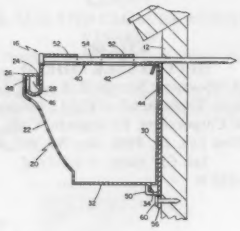
a plurality of arcuate ribs interconnected at each end at a pair of common pivots, said arcuate ribs being elastically deformable from a stowed position adjacent the space vehicle to an intermediate position spaced apart from the space vehicle in a compact bundle, and pivotable from the intermediate position to a deployed position with the ends of the ribs contiguous at the pivots and the midpoints of the ribs mutually spaced apart for defining an outside periphery having compound curvature; and

a loop connected to said space vehicle and to an intermediate portion of one of said ribs, said loop being movable for pivoting said one rib from the intermediate position to the deployed position.

## 4,314,683
## GUTTER HANGER

Joseph M. Cunning, Cohasett, Mass., assignor to Bird & Son, Inc., East Walpole, Mass.

Filed Apr. 7, 1980, Ser. No. 137,563
Int. Cl.[3] E04D *13/06*
U.S. Cl. 248—48.2 3 Claims



1. A gutter hanger for attachment to the wood fascia of a building for supporting a horizontal, generally U-shaped gutter having a front wall with an inwardly and downwardly turned flange providing an open bottom recess extending continuously along its horizontal upper edge, a horizontally extending, generally straight vertical rear wall and a bottom wall having a downwardly projecting, horizontal flange extending continuously therealong adjacent said rear wall

said gutter hanger comprising

a rigid, one piece, generally L-shaped bracket of sheet material of greater horizontal width than thickness having integrally connected, mutually perpendicular, upper forwardly extending and rear downwardly extending legs

said upper forwardly extending bracket leg being adapted to extend in a horizontal plane across the top of said gutter and having on its forward end a downwardly, forwardly and upwardly turned flange having an upwardly turned, horizontal, free end adapted to be positioned within the open bottom recess on the horizontal upper edge of the front wall of said gutter to support said upper edge of said gutter from beneath, and

said rear downwardly extending bracket leg being adapted to be located between said fascia and the rear wall of said gutter parallel thereto with the lower end of said downwardly extending leg extending downwardly beyond said rear wall of said gutter, said downwardly extending bracket leg having on its lower end forwardly and upwardly turned horizontal flange means adapted to be positioned beneath and in front of said downwardly projecting bottom wall flange to support said gutter from beneath with its rear wall parallel to said fascia

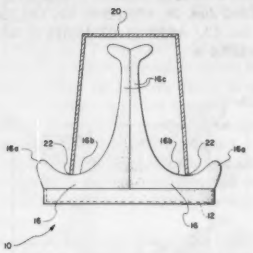
said bracket legs cooperating to support said gutter for horizontal adjustment relatively thereto in a direction parallel to said fascia

said upper forwardly extending bracket leg having integral support ferrule means extending upwardly therefrom defining a single open-bottomed extended nail receiving opening means having an axis extending therealong from a location adjacent its free end to a location adjacent said rear downwardly extending bracket leg for slideable receiving a single nail above portions of said upper forwardly extending bracket leg and above said gutter for free driving of said nail into said fascia to support said gutter hanger thereon, while allowing rotational adjustment of said gutter hanger around said nail for alignment of said gutter hanger with the gutter supported thereby.

## 4,314,684
## SANITARY GLASS HOLDER

Henry F. Bergdolt, 1200 Watergate Ct., Raleigh, N.C. 27609

Filed Sep. 13, 1979, Ser. No. 75,101
Int. Cl.[3] A47G *23/02*
U.S. Cl. 248—146 6 Claims

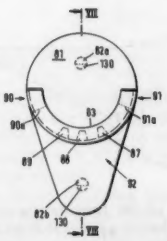


1. A sanitary glass holder for supporting a glass in an upside down position where air can freely reach the interior thereof, comprising: a base structure extending around a defined area; at least three support legs having upper suport edges and extending inwardly in a radial fashion from said base structure generally towards a central area of said defined area, said support legs being generally equally spaced apart about said base structure and form a resting and support surface about the upper edges thereof for supporting the lip of a glass disposed thereon in an upside down orientation; said support legs, interiorly of the resting and support surface, extending upwardly to form an integral elevated knock off protector that generally prohibits the glass from being inadvertently knocked from the glass holder; and said base structure and said legs cooperating to define an open area between the lip of a glass supported in an upside down orientation thereon and said base structure for allowing air to circulate into and through the interior of said upside down supported glass.

## 4,314,685
## DEVICE FOR MOUNTING A SHELF ON A COLUMN

Erich Schwan, Wecholder Str. 136, D-2800 Bremen 61, Fed. Rep. of Germany

Filed May 16, 1979, Ser. No. 39,519
Claims priority, application Fed. Rep. of Germany, May 17, 1978, 2821470
Int. Cl.[3] A47B *57/04, 57/20, 57/24*
U.S. Cl. 248—242 12 Claims



1. Device for the detachable anchoring of a merchandise deposit base on a column, which has recesses, of an indoor furnishing system having a connection plate, which carries on the back side fastening elements engaging in the recesses and is provided on the front side with a pan-shaped support device open toward the top, and having a carrier disk with a circular outline for the merchandise deposit base which can be inserted

in the support device at a selectable slant around its longitudinal axis relative to the horizontal and is secured by locking means, characterized by the fact that the carrier disk is a circular disk and that the locking means consists of at least one projection on the support device and of several recesses on the periphery of the carrier disk each of proper size for selectively receiving said projection.

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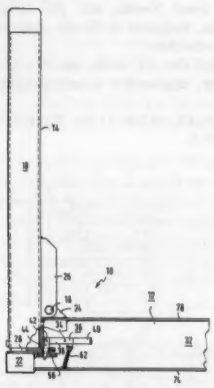
**4,314,686**
**FOLD-FLAT**

**Helmut März, Haydnweg 3, 7141 Beilstein, Fed. Rep. of Germany**

**Filed Aug. 27, 1979, Ser. No. 70,046**
**Claims priority, application Fed. Rep. of Germany, Aug. 28, 1978, 2837430**
**Int. Cl.³ B65D *19/12***
**U.S. Cl. 248—346** **11 Claims**



1. A fold-flat for supporting goods to be transported, comprising a floor plate; two end walls, said end walls being arranged to be folded when the fold-flat is transported in empty state or to be mounted in upright position when the fold-flat is loaded; and means for locking said end walls in the upright position, said locking means including at least one wedge, a lever having a first arm and a second arm connected to said first arm, and an axle mounted on said floor plate and extending substantially horizontally and through said lever in the region of connection of said first and second arms thereof, each of said walls being formed with at least one slot, said wedge being pivotable about said first arm and said lever being pivotable about said axle to move said wedge between a closed position in which said wedge is locked within said slot and an open position in which said wedge is out of register with said slot whereby said end walls can be locked in the upright position and braced relative to each other.

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**4,314,687**
**SOUND ISOLATING DEVICE FOR SUSPENDING PLUMBING PIPES**

**Daniel D. Logsdon, Fullerton, Calif., assignor to The Logsdon Foundation, Stanton, Calif.**

**Filed May 9, 1980, Ser. No. 148,390**
**Int. Cl.³ F16M *13/00***
**U.S. Cl. 248—610** **12 Claims**

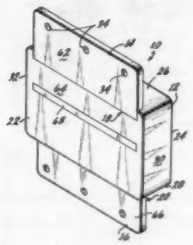
1. A device for suspending a pipe holding component or pipe elbow from a support and retarding sound propagation between said component or elbow and said support which comprises:

a first member, at least a portion of which is essentially planar, said planar portion including a support attaching means capable of being utilized in attaching said first member to said support;

a second member, at least a portion of which is essentially planar, said planar portion including a component or elbow attaching means capable of being utilized in attaching said component or elbow to said support;

a semi-resilient body essentially incapable of transmitting sound from a first location in said body to a second location in said body;

connecting means capable of fixedly connecting said first member at said first location in said body and said second member at said second location in said body and locating said first and second members with respect to one another such that said planar portion of said first member and said



planar portion of said second member are essentially parallel with each other but are not coplanar with each other;

said first member includes a mounting portion, said mounting portion and said planar portion forming a unified structure, said connecting means connecting said mounting portion of said first member to said body;

said second member includes a mounting portion, said mounting portion and said planar portion forming a unified structure, said connecting means connecting said mounting portion of said second member to said body;

said connecting means includes said body having a first cavity and a second cavity, said mounting portion of said first member fitting within said first cavity and said mounting portion of said second member fitting with said second cavity.

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**4,314,688**
**GATE VALVE**

**A. Louis Leman, Jr., Magnolia, Tex., assignor to Southwest Oilfield Products, Inc., Houston, Tex.**

**Filed Sep. 4, 1979, Ser. No. 71,996**
**Int. Cl.³ F16K *25/00***
**U.S. Cl. 251—191** **10 Claims**

1. An improved gate valve comprising

A. valve housing,

B. means defining aligned inlet and outlet passages in said housing,

C. means defining a well intercepting the inlet and outlet passages, said well being closed at one end and open at its opposite end,

D. a piston-type gate slidably positioned in the well, said gate being slidable between an open position wherein it is positioned away from the closed end of the third passage and does not intercept the inlet and outlet passages to a closed position wherein the gate seats against the closed end of the third passage and blocks said passages,

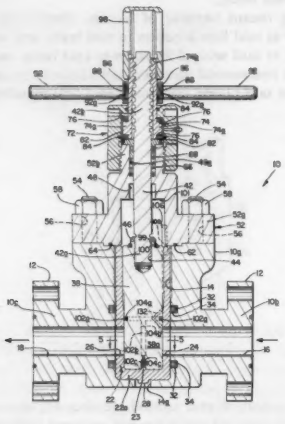
E. first seal means extending around the perimeter of the gate above said inlet and outlet passages to prevent fluid flow from the inlet passage past one end of the gate adjacent the open end of the well,

F. second seal means extending lengthwise along the gate at opposite sides thereof, said second seal means extending from the first seal means to the other end of the gate opposite the closed end of the wall, said second seal means

defining a plane which separates the inlet and outlet passages in the housing so as to prevent fluid flow from the inlet passage around the perimeter of the gate,

G. means defining a slot in said other end of the gate and extending between the free ends of the second seal means,

H. third seal means positioned in the slot and having its opposite ends connected to the free ends of the second seal means,



I. a raised key projecting out from the closed end of the well toward the gate, said key being in register with the gate slot and substantially coextensive with the third seal means so that when the gate is moved to its fully closed position after having intercepted the inlet and outlet passages, the third seal means is compressed against the key preventing fluid flow from the inlet passage past said other gate end, and

J. means for moving the gate between its open and closed positions.

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**4,314,689**

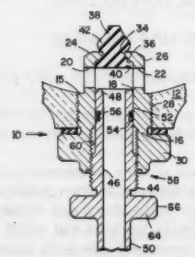
## DRAIN VALVE

**Michael E. Wilson, Modesto, Calif., assignor to Racor Industries, Inc., Modesto, Calif.**

**Filed Dec. 19, 1979, Ser. No. 105,095**

**Int. Cl.³ F16K *31/58***

**U.S. Cl. 251—351** **1 Claim**



1. A drain valve adapted for insertion into a port of a source of fluid to be drained comprising:

a substantially cylindrical body having:

(4) a groove defined about the external surface of said plug between said one end of said plug and said external thread;

a seal means for preventing contamination of said internal thread of said body and said external thread of said plug, said seal means disposed in said groove, wherein said seal means moves with said plug between and without contacting said drain port, and said internal thread of said body as said plug is actuated selectively to a drain port closing position and to a drain port opening position.

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**4,314,690**

## HYDRAULIC APPARATUS FOR THE GENERATION OF LARGE TENSILE FORCES

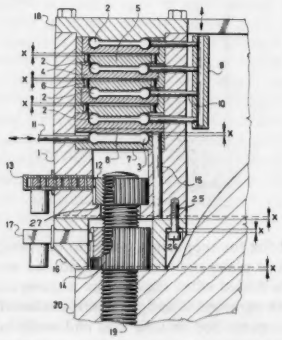
**Jan Mlynarik; Josef Novak, and Jiri Gregor, all of Plzen, Czechoslovakia, assignors to Skoda, oborovny podnik, Plzeň, Plzen, Czechoslovakia**

**Filed Oct. 31, 1979, Ser. No. 89,898**

**Claims priority, application Czechoslovakia, Oct. 31, 1978, 7083-78**

**Int. Cl.³ B23P *11/02*; E21B *19/00***

**U.S. Cl. 254—29 A** **4 Claims**

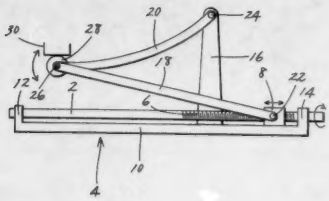


1. A hydraulic apparatus for the generation of large tensile forces, comprising a housing having a cavity therein, a plurality of expansible, compressive force generating units disposed in the cavity of the housing in stacked relationship, each of said units comprising an expansible power cell having spaced first and second diaphragms connected by a circumferential edge closure so as to present a closed space therewithin, a first plate engaging the first diaphragm of the power cell, a second plate engaging the second diaphragm of the power cell, the second plates of the successive units being disposed parallel and spaced from each other in said stack of units, first plungers disposed between the successive second plates of the units to transfer compressive forces therebetween, a support, means to connect an elongated member to be subjected to tension to said support with a portion of said member projecting from the support, means presenting a flange on the outwardly projecting portion of the member, means on the housing engaging the axially inward circumferential surface of said flange on the member, a plurality of second plungers slidably disposed in the housing in alignment with the stack of power units, said second plungers exerting compressive forces from the second plate of the power unit disposed nearest said support upon the support, and means for subjecting the spaces within the cells of the units to fluid pressure, whereby to subject the housing and the support to a force which urges them apart and subjects the elongated member to tension.

## 4,314,691
## JACK

Shichiro Sato, 172-14, Shimooichihigashimachi, Nishinomiya, Hyogo, Japan

Filed May 7, 1980, Ser. No. 147,638
Claims priority, application Japan, May 18, 1979, 54-61178
Int. Cl.[3] B66F 3/00
U.S. Cl. 254—126 8 Claims

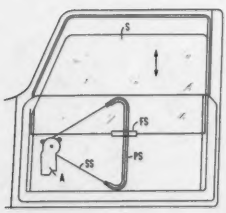



1. A jack for lifting an object comprising:
a member movable in one direction relative to the object;
a lift member to engage the object and movable generally perpendicular to said one direction between extended and retracted positions in response to movement of said member;
first and second links for moving said lift member, said first link being pivotally connected at one end to said member, and said second link being pivotally connected at one end to the other end of said first link and at the other end to a fixed point above said first link, said first and second links forming an angle between them which is maintained substantially constant throughout the range of movement of said lift member.

## 4,314,692
## ELECTRIC MOTOR-DRIVEN ROPE PULL HOIST FOR MOTOR VEHICLE DOORS

Gerhard Brauer, Oberbiel; Peter Adam, Höchberg, and Werner Seuffert, Bergrheinfeld, all of Fed. Rep. of Germany, assignors to Küster & Co. GmbH, Ehringhausen and Siemens Aktiengesellschaft, Munich, both of, Fed. Rep. of Germany

Filed Sep. 4, 1979, Ser. No. 72,311
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1978, 2838678
Int. Cl.[3] B66D 1/12; E05F 11/48
U.S. Cl. 254—362 22 Claims

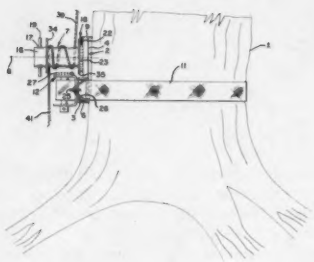



1. In a rope pull hoist, useful for operating motor vehicle doors, windows, and sliding roofs, and driven by a permanent magnet motor having a flat housing, the motor having a shaft extending into a gear box and carrying a worm, a worm gear driven by the worm and coupled to a rope drum for engaging a closed rope loop, the improvement comprising:
the motor comprising a rotor mounted in an axially oriented, magnetically nonconductive frame along with at least one permanent magnet;
pole plates for the motor being in close contact with either side of the frame and serving as flat housing halves, the housing so formed having a given thickness;
the worm wheel and the rope drum coupled to it being rotatably mounted on a shaft in the gear box; and
the gear box having a thickness less than the given thickness of the electric motor housing.

## 4,314,693
## DEVICE FOR ARBORIST CONTRACTORS

Edwin L. Hobbs, P.O. Box 295, Moraga, Calif. 94556

Filed Jun. 13, 1980, Ser. No. 159,103
Int. Cl.[3] B66D 3/00
U.S. Cl. 254—376 4 Claims



1. A load handling device for arborists attachable temporarily to a tree trunk for lowering tree limbs and main stems on a rope comprising:
a. a base having a cross member and a vertical member including an elongated leg protruding from said cross member adapted for frictional engagement with said tree trunk;
b. a cylindrical member mounted on said vertical member above said elongated leg and positioned with its longitudinal axis generally at right angles to said base; and adapted for receiving one or more turns of said rope for selectively holding said rope and for providing sliding frictional engagement therewith;
c. an upper flange connected to said vertical member above said cylindrical member protruding from said base a distance greater than said leg and adapted for resting against said tree trunk so as to tilt said longitudinal axis of said cylindrical member at an angle below a horizontal plane;
d. an elongated flexible member connected to said cross member and adapted for encircling said tree trunk; and
e. cinch means mounted on said cross member for engaging said elongated member for securely holding said elongated member and said device to said tree.

## 4,314,694
## METHOD FOR CONTROLLING EXHAUST GASES IN OXYGEN BLOWN CONVERTER

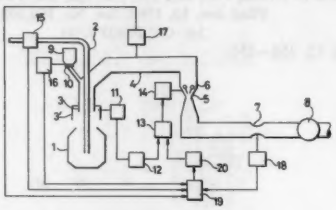
Yuziro Ueda; Toru Yoshida, both of Sakai, and Michiyasu Honda, Chihayaakasaka, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 752,288, Dec. 20, 1976, Pat. No. 4,192,486. This application Nov. 8, 1979, Ser. No. 92,361
Int. Cl.[3] C21B 7/22
U.S. Cl. 266—44 1 Claim

1. A method of recovering combustible gases exhausted during the operation of an oxygen blown converter, comprising the steps of:
(a) detecting a pressure differential between the hood of the converter and atmospheric pressure, comparing the detected pressure differential with a predetermined safe pressure differential to provide a steady-state exhaust gas damper control signal which maintains said safe pressure

differential using the actual generated gases in the converter;

(b) detecting the quantity of oxygen fed to the converter, the quantity of raw material charged to the converter, the composition of the exhaust gases and the flow rate of the exhaust gases to provide a modified exhaust gas damper control signal which maintains said safe pressure differential based upon the expected generated gases in the converter;



(c) selecting said modified exhaust gas damper control signal during ingredient modification to the converter, and selecting said steady-state exhaust gas damper control signal during steady-state operation; and

(d) adjusting the exhaust damper in the converter using the selected control signal, so as to reduce the loss of combustible gases.

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**4,314,695**

**COOLING ELEMENTS FOR FURNACES**

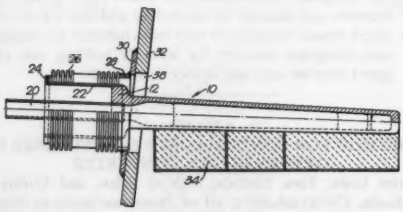
**Colin F. Widmer, Middlesbrough, England, assignor to James Brown & Sons, Middlesbrough, England**

**Filed Jan. 7, 1980, Ser. No. 110,225**

**Claims priority, application United Kingdom, Jan. 17, 1979, 01721/79**

**Int. Cl.³ F27B *1/24***

**U.S. Cl. 266—194** **8 Claims**



1. A cooling element for a furnace with a refractory lining comprising a body adapted to be inserted through a hole in the wall of said furnace and to lie within the refractory lining, said element having at least one projecting portion extending from said furnace and embodying at least two conduits, for passage of coolant to said body, an outwardly extending collar at the end of said projecting portion, a bellows surrounding said projecting portion and having a rear and a forward end, the rear end of said bellows being attached to said collar and the forward end of said bellows being adapted for attachment to the wall of said furnace.

**4,314,696**

**PAPER CURRENCY TRANSPORT CONSTRUCTION**

**Harry T. Graef, Dover, Ohio, assignor to Diebold, Incorporated, Canton, Ohio**

**Filed Nov. 15, 1979, Ser. No. 94,151**

**Int. Cl.³ B65H *5/02***

**U.S. Cl. 271—275** **13 Claims**

1. Transport mechanism for conveying paper money bills from place to place in automatic banking equipment currency dispensers including:

(a) a pair of spaced belt conveyor rolls having longitudinal axes,

(b) a flat longitudinally and laterally continuous endless rubber belt looped and tensioned around said conveyor rolls and having inner and outer surfaces,

(c) means operatively connected with at least one of said rolls to rotate such one roll to move the belt,

(d) a rigid flat platen,

(e) a rigid flat backup plate spaced from and parallel with said platen,

(f) said platen and backup plate extending between the rolls and being wider than the belt and also being parallel with the axes of said spaced rolls,

(g) the surfaces of said spaced platen and backup plate facing each other which define the space therebetween each having a low friction characteristic,

(h) one flight of the belt being located in the space between the platen and backup plate with the low friction backup plate surface engaging the inner belt surface and the low friction platen surface engaging the outer belt surface, and

(i) said one flight of the belt being movable between the rolls pressed by the backup plate against the platen substantially throughout the space between the rolls.

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**4,314,697**

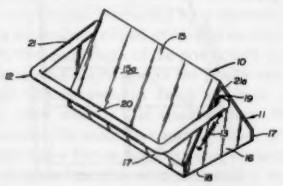
**PHYSICAL EXERCISING DEVICE**

**Maxine L. Brumfield, and Jesse E. Brumfield, both of 654 Miner Ave., Columbus, Ohio 43223**

**Filed Feb. 19, 1980, Ser. No. 122,598**

**Int. Cl.³ A63B *21/04***

**U.S. Cl. 272—136** **13 Claims**



1. A physical exercising device comprising

a base unit of elongated, wedge-shaped configuration having a generally triangular cross-section, said base unit including two upwardly inclined body supporting surfaces converging at an apex a predetermined distance above a bottom adapted to rest on a supporting surface, and

an exercise bar pivotably mounted on said base unit for swinging movement about a horizontal pivot axis extending longitudinally of said base unit, said exercise bar including a gripping portion extending longitudinally of said base unit and supported at a predetermined distance with

respect to the horizontal pivot axis of said bar and to a body supporting surface of said base unit to permit swinging of said bar from one body supporting surface to the other of said base unit over the apex thereof in an arc about said pivot axis such that said gripping portion will contactingly engage with the uppermost surface portions of a person's leg adjacent the ankles when a person's legs are extended over the base unit with the knees disposed at approximately the apex thereof.

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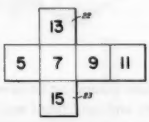
**4,314,698**

## ACTION SEQUENCING GAME

**Diva Van Dolah, 318 N. Winthrop Cir., Mesa, Ariz. 85203**

**Filed Mar. 20, 1980, Ser. No. 132,189**
**Int. Cl.³ A63F *9/00***
**U.S. Cl. 273—1 R** **5 Claims**




1. A method for playing a game with two or more players each of whom has a playing piece having a plurality of surfaces, upon each of which surfaces sensibly appear at least a different one member of a recognizable sequential pattern, at least alternate members of said recognizable sequential pattern being omitted, comprising the steps of:

(a) issuing a playing piece to each player;

(b) vocalizing said recognizable sequential pattern by all players as each player passes a playing piece to an adjacent player as each member of the sequential pattern is vocalized;

(c) hesitating in the passage of said playing piece as the member of said sequential pattern sensibly appearing on a designated surface of said playing piece is reached in the vocalization of said sequential pattern whereby the piece is not released to the adjacent player but is returned to the passing player as the next member of said sequential pattern is vocalized, the piece being actually passed to the adjacent player upon vocalization of the next following selected member of said sequential pattern;

(d) repeating the sequence of steps (b) and (c) while each player silently vocalizes said recognizable sequential pattern;

(e) designating a new surface of said playing piece indicative of another member of said sequential pattern as sensibly appears on said newly designated surface and thereby designating a new member of said sequential pattern at which the hesitating movement set forth in step (c) shall be initiated;

(f) repeating steps (b) through (e) until all-but-one surface of said playing pieces has been designated and the play advanced to a final repetition of step (d); and

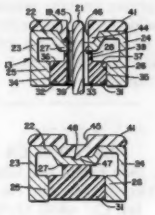
(g) designating the remaining surface of said playing piece to indicate end of play.

**4,314,699**

## GAME RACQUET

**Raymond M. Bayer, San Diego, Calif., and Robert E. Rodgers, Houston, Tex., assignors to Leach Industries, San Diego, Calif.**

**Filed Jan. 28, 1980, Ser. No. 116,213**
**Int. Cl.³ A63B *49/12***
**U.S. Cl. 273—73 D** **4 Claims**



1. In a game racquet, a composite metal and plastic frame formed to provide a head defining a stringing section and a handle, said frame comprising a metal strip and synthetic plastic core means, said metal strip being of a cross section to define an internally open channel having a bottom wall and side walls, said core means being disposed substantially entirely within said channel and being permanently bonded to inner surfaces of said channel side walls, means providing an externally open recess in said channel bottom wall extending longitudinally of said bottom wall, a first synthetic plastic strip mounted upon the outer periphery of the channel bottom wall, said first plastic strip being relatively wide and extending laterally over substantially the entire width of said bottom wall around the outer part of the head that is subject to striking stationary surfaces such as a floor or wall during play, an integral longitudinal rib on said first plastic strip extending into and occupying said recess, and two narrow plastic strips that lie substantially within said recess, said narrow plastic strips each having substantially the cross sectional area of said rib and extending along opposite sides of said head between opposite ends of the first wide plastic strip and said handle, each said plastic strip and said means defining said external channel bottom wall recess being formed with stringing holes in said stringing section, and said plastic strips and means defining said external channel bottom wall recess having a spaced series of interfitting locating projections and depressions distinct from said stringing holes along their coextensive lengths.

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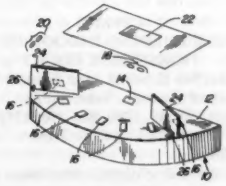
**4,314,700**

## CARD COUNTING PREVENTION APPARATUS FOR BLACKJACK

**Kenneth C. Dylag, 705 W. 65th St., Westmont, Ill. 60559**

**Filed Oct. 3, 1980, Ser. No. 193,419**
**Int. Cl.³ A63F *1/06***
**U.S. Cl. 273—148 R** **26 Claims**



1. Apparatus for preventing card-counting in blackjack played at a blackjack card table comprising a table, a dealer

station on one side of said table having a dealer vantage point above and behind said dealer station from which a dealer may view said table, a plurality of player stations on the opposite side of said table, each said player station having a player vantage point above and behind each of said player stations for viewing said table, said player stations partially surrounding said dealer station, a checker vantage point over said table from which a checker may view said table, and means for obstructing the view of at least one of the said player stations from each of said player vantage points without obstructing the view of any of said player stations from said dealer vantage point, said dealer station from any of said player vantage points, and said dealer station and each of said player stations from said checker vantage point.

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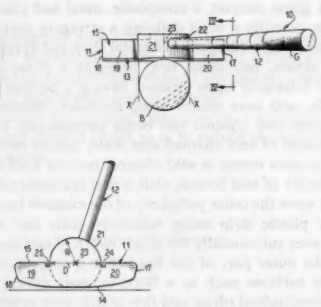
**4,314,701**
**PUTTER CLUB**
**Arthur P. Swanson, 1454 Estate La., Glenview, Ill. 60025**
**Filed Dec. 5, 1980, Ser. No. 213,367**
**Int. Cl.³ A63B *53/04***
**U.S. Cl. 273—164** **9 Claims**



**1.** A golf putter comprising a generally rectangular blade head with a flat planar front putting face, a bottom sole, heel and toe end portions with top faces, a raised central enlarged height fragmental cylindrical mid-section above said top faces and coplanar with said front putting face, said mid-section having an exposed greater than semi-cylindrical top cylindrical periphery visible to the full diameter thereof, said mid-section having an axis normal to said putting face at a level adjacent the top faces and above the bottom of the exposed periphery, said mid-section having a radius the same as the golf ball to be putted, a substantially flat bottom on said sole intersecting an imaginary continuation of said cylindrical portion, and a shaft having a bottom end projecting upwardly from said mid-section with an axis intersecting said axis of said mid-section whereby alignment of the exposed top periphery vertically and horizontally behind the golf ball positions the sole off of the putting surface, accommodates variations in the positions of the golfer's eyes and causes the putting face to impact the ball on said axis of said mid-section.

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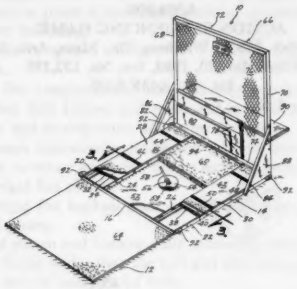
**4,314,702**
**PORTABLE FOLDING INDOOR-OUTDOOR HORSESHOE COURT**
**Harold K. Updike, 946 E. 6th St., and Kenneth N. Updike, 1737 E. 5th St., both of Fremont, Nebr. 68025**
**Filed Feb. 15, 1980, Ser. No. 121,930**
**Int. Cl.³ A63B *67/00***
**U.S. Cl. 273—336** **5 Claims**

**1.** A portable horseshoe court, comprising:

a horizontally disposed frame means including spaced-apart front and rear frame members having opposite ends, a first side frame member secured to and extending between said front and rear frame members at one end thereof, a second side frame member secured to and extending between said front and rear frame members at the other end thereof, a first intermediate frame member secured to and extending between said front and rear frame members inwardly of said first side frame member, a second intermediate frame member secured to and extending between said front and rear frame members inwardly of said second side frame member,

a first pitcher's platform positioned between said first side frame member and said first intermediate frame member extending between said front and rear frame members,

a second pitcher's platform positioned between said second side frame member and said second intermediate frame member extending between said front and rear frame members,



a pan means extending between said intermediate side frame member and said front and rear frame members to define an area capable of receiving dirt,

a stake extending upwardly from said pan means equidistantly between said platforms,

a normally upstanding backstop means having upper and lower ends, said backstop means having its lower end pivotally connected to the rearward end of said frame means whereby said backstop means may be selectively pivoted from its normal upstanding position behind said frame means to a substantially horizontal transport position at least partially over said platforms and pan means,

and means selectively maintaining said backstop means in its said upstanding position.

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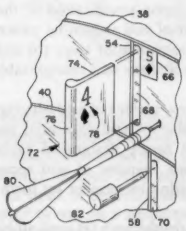
**4,314,703**
**DART GAME AND BOARD**
**Oresto P. Grottola, 9305 S. Velare St., Anaheim, Calif. 92804**
**Filed Jun. 13, 1980, Ser. No. 159,046**
**Int. Cl.³ F41J *3/00***
**U.S. Cl. 273—408** **11 Claims**



**5.** A dart board comprising:

a front face of material suitable for receiving and detachably

retaining the point of a dart, said front face being divided into fifty-two target spaces;

an indicia in each of said target spaces, each of said indicia corresponding to a different one of the indicia on a standard bridge deck of playing cards;

an opening in the face of said board in association with each of said target spaces and an insert removably positioned within each of said openings an indicia on each of said inserts, said indicia being positioned to be hidden when said insert is within its opening, each of said indicia on said inserts being different and each corresponding to one of the indicia on playing cards in a standard bridge deck.

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**4,314,704**

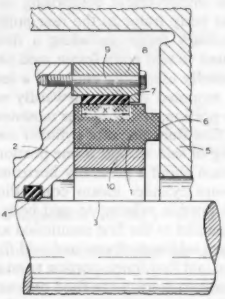
## ROTARY MECHANICAL FACE SEALS

**Colin A. Wichall, Hampshire, England, assignor to Crane Packing Limited, Slough, England**

**Filed Mar. 10, 1980, Ser. No. 128,880**

**Int. Cl.³ F16J** *15/38, 15/48*

**U.S. Cl. 277—27** **4 Claims**



**1.** A face seal assembly comprising a rotatable shaft, a seat member located about the shaft, a seal face member located about the shaft with the seal face thereof in intimate sealing contact with the seat member, the seal face member and the seat member being arranged such that rotation of the shaft causes relative rotation between the seal face member and the seat member, said seal face member having a first side which in use is subject to a variable fluid pressure, and a second side which is opposite to said first side with said seal face lying between said first and second sides, a rigid support ring located about said shaft and being movable relative thereto, said support ring being disposed adjacent to said second side of the seal face member, and pre-stressing means arranged to press against said first side of the seal face member such as to pre-stress said seal face member against said support ring with a load related to said variable fluid pressure so that any distortion of said seal face member produced by variation in fluid pressure is substantially counter-acted.

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**4,314,705**

## OIL SEAL DEVICE

**Masami Shimizu, Chiba, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed May 19, 1980, Ser. No. 150,804**

**Claims priority, application Japan, May 23, 1979, 54-69224[U]; Jul. 10, 1979, 54-94991[U]**

**Int. Cl.³ F16J** *15/42*

**U.S. Cl. 277—67** **6 Claims**

**1.** In a high speed rotating machine, in combination:

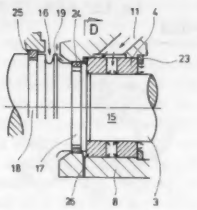
(a) a common rotating turbine and blower shaft;

(b) a bearing casing having a bearing portion and an oil discharge chamber formed below said bearing portion;

(c) an oil thrower laterally spaced from said casing and mounted on said shaft;

(d) a floating metal structure supported in said casing bearing portion and supporting said shaft;

(e) first and second oil seal rings, the first of said oil seal rings being mounted in said casing between and laterally spaced from said oil thrower and one end of said floating metal structure and the second of said oil seal rings being



mounted in machine structure on an opposite side of said thrower; and

(f) structural means forming oil release and gap openings enabling oil accumulating between said first oil seal ring and said floating metal structure to be communicated to said oil discharge chamber.

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**4,314,706**

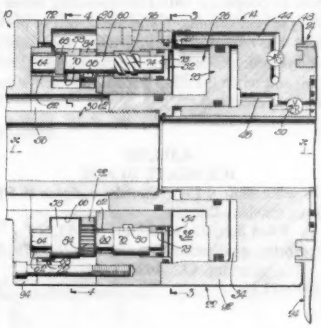
## CHUCKS OF CONSTANT JAW FORCE

**Samuel H. Pruden, East Hartford, Conn., assignor to Cushman Industries, Incorporated, Hartford, Conn.**

**Filed May 7, 1979, Ser. No. 36,739**

**Int. Cl.³ B23B** *31/14, 31/30*

**U.S. Cl. 279—1 C** **8 Claims**



**1.** In a chuck having a body with a through-hole about an axis and being turnable about said axis and carrying radially movable jaws, the combination of jaw operating means including a cylinder and piston in said body for closing the jaws on work on admission of operating fluid under pressure into one end of the cylinder, a plunger in said body ring-shaped about said axis and projecting with one end into said cylinder end and being axially movable in opposite directions to decrease and increase the volume of said cylinder end, and other means, including a weight in said body formed in separate sections angularly spaced about said axis and individually movable inwardly toward and outwardly away from said axis within a ring-shaped zone about said axis, with said sections being yieldingly urged toward said axis, and operative to move said plunger in one of said directions on outward movement of said weight sections under centrifugal force to thereby change the pressure of the operating fluid in said cylinder end for counteracting the effects of centrifugal force on said jaws, said cylinder and piston are ring-shaped about said axis and surround said through-hole, said plunger is within the inner and outer

diametric confines of said cylinder, and said zone surrounds said through-hole.

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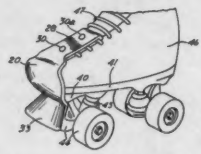
4,314,707
TOE GUARD FOR ROLLER SKATES
Don Welch, P.O. Box 337, Vail, Colo. 81657
Filed Feb. 25, 1980, Ser. No. 124,427
Int. Cl.³ A63C 17/26
U.S. Cl. 280—11.2 9 Claims



1. A replaceable toe protector for use in connection with a shoe-type roller skate having a lace closure and a toe stop fixed to the skate adjacent to the toe of the shoe, comprising:

an elongated flexible body having a strap portion at a first end of the body, a skate attaching portion at a second end of the body, and a toe covering portion interconnecting the strap portion and the skate attaching portion, the strap portion being adapted to be reversibly folded back on itself to form a loop for encasing at least a portion of the lace closure of the shoe-type roller skate and including means for fastening the folded back strap portion into the loop, and the skate attaching portion including a bolt hole adapted to receive a bolt of the toe stop and further including a series of depending position holding elements adapted to cooperate with corresponding bores in the toe stop to prevent turning of the toe covering portion away from its toe covering position when the skate attaching portion is attached between the skate and the toe stop by the bolt and when the strap portion is attached to the skate by the lace closure.

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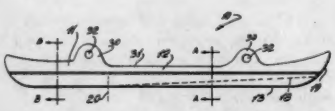
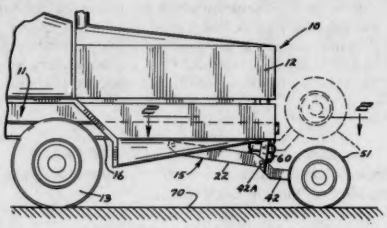
4,314,708
ICE SKATE BLADE
Peter F. Zuuring, Baie d'Urfe, Canada, assignor to PFZ Enterprises Inc., Quebec, Canada
Filed Jun. 22, 1979, Ser. No. 51,042
Claims priority, application Canada, Jun. 7, 1979, 329428
Int. Cl.³ A63C 1/32
U.S. Cl. 280—11.18 18 Claims



1. An ice skate blade for use on a surface of ice and characterized by a reduced coefficient of friction between said blade and said surface of ice comprising an elongated flat blade body having opposed side walls and a support bottom edge, said bottom edge having a single elongated slot in at least a forward half portion thereof intermediate said opposed side walls, a remaining rear portion of said bottom edge constituting a solid support rear portion and wherein said slot collects ice and snow from said surface of ice so as to form a lubricating film between said blade and said surface thereby providing said reduced coefficient of friction between said blade and said surface of ice.

4,314,709
LOAD TRANSFER TRAILER FOR TRANSIT MIXER
Frederick J. Silbernagel, 148-7th SE., Huron, S. Dak. 57350
Filed Aug. 4, 1980, Ser. No. 175,062
Int. Cl.³ B62D 61/12
U.S. Cl. 280—81 A 13 Claims



1. In combination with a motor vehicle attachment having a body frame, the improvement comprising an auxiliary frame mounted to said body frame to the rear portion of said body frame, said auxiliary frame including a first frame portion pivotally mounted to said body frame, said first frame portion having a rearwardly extending end, and a second frame portion pivotedly mounted to the rearwardly extending end of said first frame portion, wheel means mounted on said second frame portion, first fluid pressure cylinder means for controlling the pivoting of said second frame portion relative to said first frame portion about a generally horizontal axis, and second fluid pressure cylinder means controlling movement of said first frame portion relative to said body frame about an axis generally parallel to the first mentioned axis, spring means mounted between said body frame and said first frame portion operable to urge said first frame portion to an upward position, and control means to control the fluid pressure in said second mentioned fluid pressure cylinder means, and to control pivoting of said second frame portion relative to said first frame portion.

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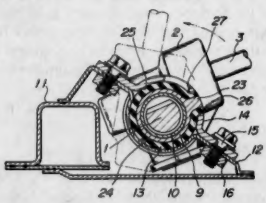
4,314,710
RACK AND PINION STEERING GEAR HOUSING MOUNTING STRUCTURE
Akio Kamoshita; Akihiko Matsumoto, and Takashi Kurihara, all of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Aug. 30, 1979, Ser. No. 71,123
Claims priority, application Japan, Sep. 5, 1978, 53-121125[U]
Int. Cl.³ B62D 1/00
U.S. Cl. 280—96 7 Claims



1. In a rack and pinion steering gear housing mounting structure for an automotive vehicle including a steering gear housing having a housing mounting portion, a support bracket on a vehicle frame for supporting said housing mounting portion and a clamp plate for clamping said housing mounting portion to said support bracket, the improvement comprising said housing mounting portion having a cylindrical wall rotatably seated in a cylindrical cavity on the support bracket, positioning means on said housing mounting portion arranged oppositely to said cylindrical cavity, and engaging means

provided on said clamp plate for cooperating with said positioning means to rotatably fix said housing mounting portion at a selected angle relative to said support bracket.

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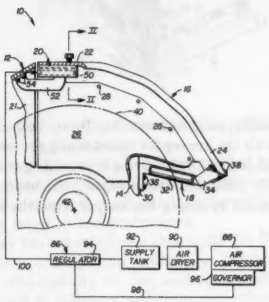
## 4,314,711
## GAS CUSHION APPARATUS

**Gail F. Westendorf, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**

**PCT No. PCT/US79/00472, § 371 Date Jul. 2, 1979, § 102(e) Date Jul. 2, 1979**
**PCT Filed Jul. 2, 1979, Ser. No. 89,778**
**Int. Cl.³ B62B 9/16**
**U.S. Cl. 280—154** **13 Claims**




1. A gas cushion apparatus (10) for a vehicle (12), comprising:

a vehicle structural member (14) having a relatively large effective mass that vibrates in use;

a vehicle fender (16) connected to the structural member (14) and being of a construction sufficient for vibrating at less than about 60 cycles per second with operation of the vehicle;

another member (21); and

cushion means (20) for controllably distributing a gas to a preselected region (80) between the fender (16) and the another member (21) and reducing the transmission of vibratory forces from the fender (16) into the another member (21).

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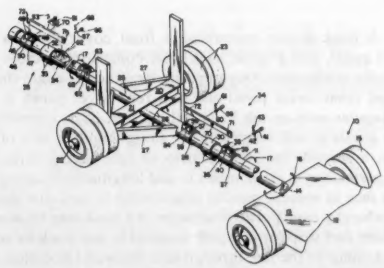
## 4,314,712
## POLE TRAILER

**Edward E. Owen, Hwy. 49, Bond, Miss. 39550, and James F. Loveless, Rte. 1, Box 189, Brooklyn, Miss. 39425**

**Filed Sep. 10, 1979, Ser. No. 73,631**
**Int. Cl.³ B62D 53/00**
**U.S. Cl. 280—404** **18 Claims**



1. In a trailer for an automotive draft vehicle, said trailer including an elongated coupling member having a longitudinally extending axis, means adapted to connect a forward end of said coupling member to said vehicle, and a rear axle assembly mounted on said coupling member for slidable movement along said axis and rotatable movement about said axis, the improvement comprising:

stop means fixed to said coupling member forward of said axle assembly, said stop means limiting forward sliding movement of said axle assembly by abutment therewith; a coupling element mounted on said coupling member forward of said stop means for slidable movement along said axis and rotatable movement about said axis; first attaching means on said axle assembly; second attaching means on said coupling element; an elongated removable connecting member; first detachable means for connecting one end of said connecting member to said first attaching means; and second detachable means for connecting the other end of said connecting member to said second attaching means, said connecting member and said stop means being shaped such that with said connecting member attached to said axle assembly and said coupling element, said axle assembly and said coupling element are free to rotate about said axis relative to said stop means through an arc substantially greater than 180° and the rearward sliding movement of said axle assembly is limited by said coupling element abutting said stop means.

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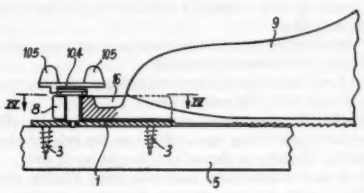
## 4,314,713
## BINDING FOR FASTENING A BOOT TO A SKI

**Armand Kreyenbuhl, Samoens, France, assignor to Adidas Fabrique De Chaussures De Sport, Landersheim, France**

**Filed May 2, 1979, Ser. No. 35,386**
**Claims priority, application France, May 10, 1978, 7813880**
**Int. Cl.³ A63C 9/18**
**U.S. Cl. 280—615** **8 Claims**

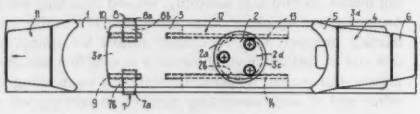



1. A ski binding of the type in which a boot is fastened to a ski by an extension of the sole of the boot and which extension engages an arch plate fixed to the ski, the arch plate having a shape corresponding in width and height to that of the extension, the extension having a recess comprising an inlet at the front of the extension communicating with an opening formed in the extension and of a size larger than inlet, the boot being secured to the ski by a locking means which locks the extension in the arch plate, said locking means comprising, a bar rotatable around an axis and extending vertically in the arch plate, said bar being rotatable, between a first angular position in which the binding is unlocked and said bar can pass through the inlet of the extension during forward insertion of the extension into the arch plate, and a second angular position in which the binding is locked and said bar engages a wall of said opening in the extension to prevent rearward withdrawal of the extension from the arch plate.

## 4,314,714
## SAFETY SKI BINDING

Ulrich Gertsch, Brungasse 92, 3800 Matten, Interlaken, Switzerland, assignor to Ulrich Gertsch, Matten b. Interlaken and Ernst Gertsch, Wengen, both of, Switzerland

Filed Aug. 6, 1979, Ser. No. 63,834
Claims priority, application Switzerland, Aug. 24, 1978, 8974/78
Int. Cl.³ A63C 9/082
U.S. Cl. 280—630 13 Claims



1. A safety ski binding for use with a ski comprising, in combination:
- a release plate;
- means for pivotably mounting the release plate at the ski for movement between a normal skiing position and a laterally pivoted position in the event that the skier suffers a torsional fall;
- a heel holder for holding the heel of a ski boot used with the safety ski binding;
- a sole holder for holding the sole of the ski boot;
- one of said holders being capable of being fixedly arranged at the ski;
- the other of said holders being secured at the release plate;
- entrainment means provided for said release plate and coacting with said ski boot for releasably retaining the ski boot at the release plate;
- said release plate, when in its normal skiing position, being decoupled from the ski fixed-holder and freely pivotable to both sides;
- return means for resetting said release plate, after pivoting thereof, back into its normal skiing position;
- said entrainment means is movably connected with said release plate;
- said entrainment means being movable out of an effectual position where it releasably retains the ski boot at the release plate, following pivoting of the release plate, into a release position where it releases the ski boot from the release plate;
- said entrainment means comprises at least two oppositely situated entrainment elements;
- each of said entrainment elements being rotatably connected by a shaft with the release plate;
- each of said entrainment elements, when in its effectual position, protruding upwardly from the release plate and bearing laterally at the sole of the ski boot; and
- each of said entrainment elements being tiltable about its related shaft downwardly into its release position.

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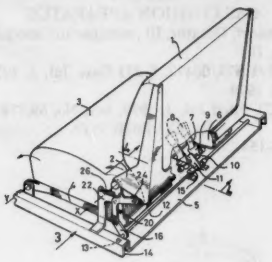
## 4,314,715
## AUTOMOBILE VEHICLE SEAT STRUCTURE PROVIDED WITH A DEVICE FOR HOOKING SAFETY BELTS

Pierre Duguet, Feucherolles, and Christian Robert, Rueil Malmaison, both of France, assignors to Automobiles Peugeot and Societe Anonyme Automobiles Citroen, both of Paris, France

Filed Feb. 13, 1980, Ser. No. 121,227
Claims priority, application France, Feb. 21, 1979, 79 04410
Int. Cl.³ B60R 21/10
U.S. Cl. 280—801 6 Claims

1. An arrangement comprising in combination with a vehicle having a floor, a hooking device for safety belts, a seat structure comprising a backrest and a seat, the backrest being mounted at the base thereof on a rear part of the seat to pivot about a first transverse axis between an operative position and an inoperative position, the seat being pivotally mounted on the floor in the vicinity of the front part of the seat to pivot about a second transverse axis, and connecting means for connecting the hooking device to the floor, said connecting means comprising a latch carried by the hooking device, a



keeper pivotally mounted on the floor, maintaining means associated with the keeper for maintaining the keeper engaged with the latch when the backrest is in said operative position, and elastically yieldable means biasing the maintaining means in a direction for releasing the keeper from the latch.

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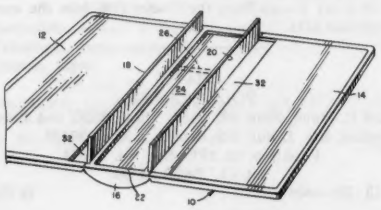
## 4,314,716
## BOOK BINDERS WITH TABS

Dominic R. Errichiello, 389 Meadowlark Rd., Bloomingdale, Ill. 60108

Filed Aug. 6, 1979, Ser. No. 63,830
Int. Cl.³ B42D 3/00
U.S. Cl. 281—29 2 Claims

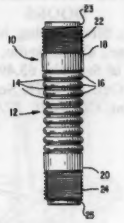


1. A book binder comprising a front cover panel, a rear cover panel, and a spine; said spine comprising a cross wall hingedly connected along opposite longitudinal edges thereof to said front cover panel and said rear cover panel; a first, rectangular strip or tab having three free sides, extending at right angles to and longitudinally along the inner face of said spine; a second, rectangular strip or tab, having three free sides, extending at right angles to and longitudinally along said inner face in spaced, parallel relationship to said first strip or tab, whereby edge portions of pages of a book may be inserted between said strips or tabs and mounted in said book by stitching, stapling or the like through said strips and said edge portions, each of said panels having a shallow, elongated, rectangular cavity adjacent its spine-contiguous edge to form a pocket into which fits said strips or tabs when the book binder is closed.

## 4,314,717
## RESILIENT SPRINKLER NIPPLE

James M. Bjurman, Salt Lake City, Utah, assignor to Multi-Flex Corporation, Salt Lake City, Utah

Filed May 16, 1980, Ser. No. 150,306
Int. Cl.³ F16L 55/00
U.S. Cl. 285—5 4 Claims




1. A flexible plastic nipple for coupling a sprinkler head to a sprinkler system pipeline comprising:

a generally elongated single plastic molded tubular piece having a pair of end sections and a resilient center section defined by an outer wall carrying annular undulations including recesses and protrusions;

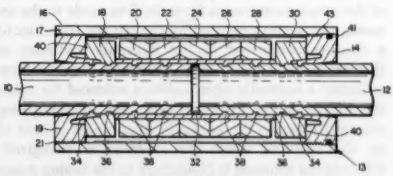
said recesses having relatively thin walls for flexibility and said protrusions having relatively thicker walls for strength and stability so that said center section is sufficiently rigid to maintain said elongated tubular piece in a fixed position under the normal operation of a sprinkler system and is responsive to a deflecting force greater than the rigidity of said center section for bending and for subsequently rebounding to its original position when said deflecting force is removed;

each end section including a rigid portion, positioned adjacent said center section, a flexible threaded section connected to said rigid portion for mating the nipple with a connector fitting on the sprinkler head or pipeline, and a snub portion connected to said threaded section for leading said threaded section into the connector fitting, said threaded section having sufficient flexibility to prevent rupturing or stripping when a force is transmitted thereto and said center section bending before the force transmitted to said threaded section becomes excessive.

## 4,314,718
## TENSILE RING COMPOSITE PIPE COUPLING

Harry C. Broyles, Sunnyvale, and Laszlo Szalvay, San Carlos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Nov. 28, 1979, Ser. No. 98,088
Int. Cl.³ F16L 13/04
U.S. Cl. 285—114 4 Claims




1. A composite pipe coupling comprising:

(a) a liner means having an opening therethrough capable of receiving the ends of the pipes to be connected;

(b) driver means of heat-recoverable metallic material having an opening therethrough mounted concentrically around said liner means, said driver means constricting radially inwardly upon heat recovery to grip said liner means and to deform said liner means into a sealing condition with pipes to be connected;

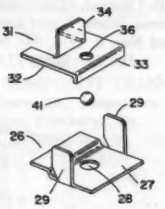
(c) a pair of tensile rings of heat-recoverable metallic material, one of said tensile rings being axially mounted adjacent and in axial contact with one end of said liner means, and the other of said tensile rings being axially mounted and in contact with the other end of said liner means, said tensile rings constricting radially inwardly upon heat recovery to each grip a pipe to be connected; and

(d) external support means having an opening therethrough mounted concentrically around said liner, driver means and said tensile rings to axially contain and support said tensile rings and the liner means positioned between said tensile rings.

## 4,314,719
## SLIDING PANEL LATCHING MECHANISM

Donald Hawkins, P.O. Box 1203, Tracy, Calif. 95376

Filed Feb. 12, 1980, Ser. No. 120,777
Int. Cl.³ E05C 19/00, 1/04
U.S. Cl. 292—252 9 Claims




1. In a channel-like track construction for receiving a sliding member, a latch assembly for releasably locking in said track and preventing translation of said sliding member thereby, said latch assembly including one or more detent depressions spaced longitudinally along and formed in the base panel of said track; a slide member secured in said track and adapted for longitudinal translation therealong, said slide member including a first aperture extending vertically therethrough and registerable with any one of said detent depressions; a ball seated in said aperture and adapted to fall gravitally therethrough into any of said detents; a latch member including a second aperture extending vertically therethrough, said second aperture being smaller in diameter than said ball; first means for joining said latch member to said slide member for longitudinal translation therewith, said latch member being translatable with respect to said slide member transverse to said track to move said second aperture into and out of alignment with said first aperture; second means for spacing said latch member above said slide member to retain said ball therebetween, said latch member and slide member being spaced apart a distance less than the diameter of said ball.

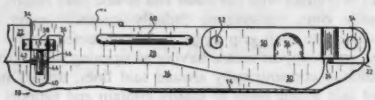
## 4,314,720
## SPLIT RING LOCKING ASSEMBLY

Cesar Santoni, Hamilton, Canada, assignor to Greif Bros. Corporation, Delaware County, Ohio

Filed Oct. 16, 1979, Ser. No. 85,262
Int. Cl.³ E05C 19/08
U.S. Cl. 292—256.69 20 Claims

1. A locking rim assembly for use in releasably holding a cover in an assembled relationship with a container comprising: a split ring having two ends positioned substantially adjacent to one other; a locking lever having a base end which is pivotally connected to one end of the split ring; a connecting link pivotally connected at one of its ends to the split ring and at its other end pivotally connected to the locking lever; the pivotal connections being so constructed and arranged so that

the locking lever is shiftable from an open position at which the split ring is in an expanded position to a closed position at which the split ring is in a contracted position; said locking lever having at its end opposite to that which connects directly with the split ring a tongue; said tongue having a receiving means capable of receiving a sealing wire; a receptacle located



on said split ring for the tongue when the locking lever is in its closed position; wherein when said locking lever shifts from its open to its closed position said tongue and receiving means pass through said receptacle so that a sealing wire may be secured to said receiving means to inhibit unauthorized opening of the locking rim assembly.

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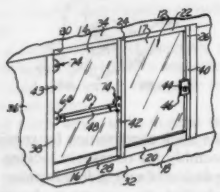
**4,314,721**

## SECURITY BAR FOR SLIDING DOOR OR WINDOW

**John D. Clark, Mt. Clemens, Mich., assignor to Larry Raymond Praet, Port Huron, Mich., a part interest**

**Filed Nov. 5, 1979, Ser. No. 91,096**
**Int. Cl.³ E05D *13/04***
**U.S. Cl. 292—262** **9 Claims**



1. A security bar for holding in a closed position a sliding panel provided with a frame dorsal surface adapted to be displaced substantially parallel to a jamb surface toward and away from said jamb surface during opening and closing of said panel, said safety bar comprising a bar member having each end formed with a curvilinear cylindrical face, and means at each end of said bar member for holding said bar member in an operative position preventing said frame dorsal surface of said sliding panel from being displaced towards said jamb surface with the longitudinal axis of said bar member substantially perpendicular to said frame dorsal surface and said jamb surface, wherein said means holding said bar member in said operative position comprises a pivotal support attached to one of said surfaces and a clip attached to the other of said surfaces, said pivotal support comprising a substantially U-shaped bracket member attached to said one of said surfaces and a pair of substantially parallel sidewalls one disposed on each side of said bar member at an end thereof, and a pivot pin member engaged through aligned apertures in said sidewalls and through said bar member proximate one of said curvilinear cylindrical end faces, and said clip comprises a generally U-shaped member having a mounting portion fastened to said other of said surfaces, said generally U-shaped member having a pair of opposite substantially parallel sidewalls each disposed on one side of said bar member and means in said clip sidewalls engageable with said bar member proximate the other of said curvilinear cylindrical end faces for supporting said bar member, wherein said apertures in said bracket member sidewalls, said pivot pin member and said supporting means in said clip are arranged to allow each curvilinear cylindrical end face of said bar member to provide line engagement with a planar surface corresponding to one of said surfaces and for opposing motion of one of said surfaces toward the other, and to cause said bar member to absorb in compression forces causing said motion, with said lines of engagement aligned substantially with said bar member longitudinal axis.

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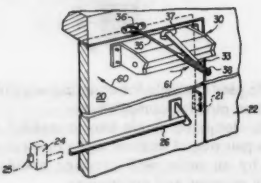
**4,314,722**

## TIMING APPARATUS FOR DELAYING OPENING OF DOORS

**Emanuel L. Logan, Jr., Silver Spring, Md., assignor to Reliable Security Systems, Inc., Cockeysville, Md.**

**Continuation-in-part of Ser. No. 65,491, Aug. 20, 1979. This application Oct. 30, 1979, Ser. No. 89,398**
**Int. Cl.³ E05C *17/32***
**U.S. Cl. 292—263** **7 Claims**



1. In a door securing system wherein the door is hinged along one edge to a door frame and is secured by a latch along at least one other edge to the door frame and wherein the latch is operated by a panic bar to unlatch the door; the improvement comprising:

an attachment mounted between the door and door frame for operation in two modes wherein the first mode prevents opening of the door even when the door is unlatched and wherein the second mode permits opening of the door when the door is unlatched; the attachment comprising:

a hydraulic cylinder with a piston mounted therein for displacing fluid from the hydraulic cylinder;

means for driving the piston to displace the fluid from the hydraulic cylinder;

linkage means for connecting the driving means between the door frame and door whereby force on the door is transmitted through to the piston for displacing the piston;

means for delaying transition of the attachment means from the first mode to the second mode wherein the delaying means includes:

electrical switch means for providing a signal indicating that an attempt to open the door is occurring;

timing means started by the signal of the electrical switch means for emitting a trigger signal after a predetermined interval;

means operated by the trigger signal for allowing transition of the attachment means from the first mode to the second mode; the means operated by the trigger signal including a throttle connected to the hydraulic cylinder which throttle permits the fluid to gradually displace from the cylinder; a normally open valve; a solenoid for operating the valve, and a drop-out relay for de-energizing the solenoid wherein the normally open valve is held closed by the solenoid when the solenoid is energized and wherein the solenoid is connected to the timing means via the drop-out relay; whereby when the trigger signal is emitted, the drop-out relay opens, de-energizing the solenoid and allowing the closed normally open valve to open so that the fluid can be displaced and the door opens if pushed; and

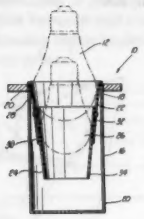
means for indicating that an attempt has been made to open the door.

4,314,723

## APPARATUS FOR REMOVING AND INSTALLING A LIGHT BULB IN A LIGHT FIXTURE

Robert R. Vermillion, 302 S. Martinson, Wichita, Kans. 67213

Filed Mar. 5, 1980, Ser. No. 127,409
Int. Cl.[3] H01K *3/32*
U.S. Cl. 294—20 1 Claim



1. An apparatus for removing and installing a light bulb in a light fixture, the apparatus comprising:

a tubular housing having an open first end portion and a second end portion;

a balancer disposed around the outside of the open first end portion of the tubular housing to aid in balancing the apparatus when removing and installing the light bulb;

a first tubular shaped cup having an open first end portion and a second end portion, the sides of the cup tapered inwardly from the first end portion to the second end portion, the first cup received inside the open first end portion of the housing with the first end portion of the first cup secured to the inside of the open first end portion of the housing; and

a second tubular shaped cup having an open first end portion and a second end portion, the second cup tapered inwardly from the first end portion to the second end portion, the second cup received inside the first cup and extending through the second end portion of the first cup, the first end portion of the second cup secured to the sides of the first cup; and

the cups adapted for receipt around the light bulb and gripping the sides thereof, whereby by rotating the second end portion of the housing the light bulb can be removed and installed.

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4,314,724

## HAND HELD TONGS

Stephen L. Barna, 1129 N. State Rd., Ionia, Mich. 48846

Filed Sep. 17, 1979, Ser. No. 76,262
Int. Cl.[3] A47J *19/02*; B25B *9/02*
U.S. Cl. 294—99 R 2 Claims

2. A pair of tongs comprising:

a pair of substantially rigid arms having first and second ends; said second arm ends being shaped to grasp an object therebetween;

a flexible leaf spring having a resilient body and first and second ends;

means connecting said first and second leaf spring ends with a different one of said arm first ends, and comprising:

a plug connected with one of said arm first ends and said leaf spring ends, and having a pair of prongs positioned in a spaced apart and substantially parallel relationship; said prongs having free ends which are converged along a plane during use, and have opposing barbs thereon projecting outwardly of said prongs along said plane;

a receptacle connected with the other of said arm first ends and said leaf spring ends, and comprising a sleeve having a central aperture shaped to receive said prongs therein in a locked position, and anchor means disposed adjacent opposing sides of said prongs in the locked position, and abuttingly engaging said barbs and preventing inadvertent withdrawal of said plug from said receptacle; and wherein

said leaf spring has a substantially linear shape in a free condition and is elastically flexed into a U-shaped configuration in a tensed condition when connected with said tong arms, whereby said leaf spring both pivotally interconnects said tong arms and resiliently urges the same apart.

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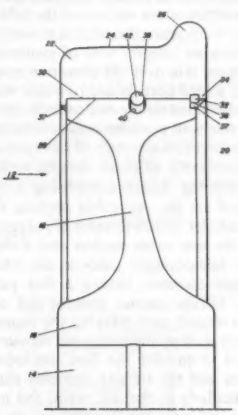
4,314,725

## RING DAMPED COMPOSITE TRANSIT WHEEL

John J. Mede, Lewistown, Pa., assignor to Titanium Metals Corporation of America, Pittsburgh, Pa.

Filed Feb. 25, 1980, Ser. No. 124,180
Int. Cl.[3] B60B *17/00*
U.S. Cl. 295—11 8 Claims



1. A transit wheel comprising:

a generally disk-shaped metallic body having a bore through the center thereof, a hub about the bore extending through a web to an outer portion, said web having a reduced cross-sectional thickness with respect to the hub in the outer portion,

a separate metallic annular rim having a circular inside surface, generally planar in cross section, disposed against a circular outside surface, generall planar in cross section, of the outer portion,

said inside surface of the annular rim and said outside surface of the outer portion each provided with a circumferential groove, which grooves are substantially aligned when the inside surface of the annular rim is disposed against the outside surface of the outer portion, and

a rigid damping rod formed into a ring and disposed within the aligned grooves in the inside surface of the annular rim and the outside surface of the outer portion, said ring

traversing at least about 95% of the circumference of the aligned grooves.

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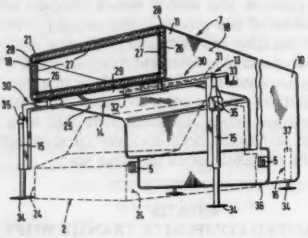
**4,314,726**

## CABIN STRUCTURE DISPLACEABLY MOUNTABLE ON A VEHICLE

**Wolfgang Artweger, Windischgarsten, and Otfried Reitz, Saalfelden, both of Austria, assignors to "Wohn-Art" Freizeitartikel Gesellschaft m.b.H., Windischgarsten, Austria**

**Filed Jan. 14, 1980, Ser. No. 111,947**
**Claims priority, application Austria, Jan. 25, 1979, 578/79**
**Int. Cl.³ B60P *1/64, 3/34***
**U.S. Cl. 296—164** **3 Claims**



1. A van comprising a vehicle having two side walls and a driver's cab; a cabin displaceably mountable on the vehicle, the cabin having sections of different cross sectional areas, adjacent ones of the cabin sections of different cross sectional areas abutting at transition zones and one of the cabin sections fitting over the driver's cab when the cabin is mounted on the vehicle, the cabin having an integral wall of synthetic resin material with an aluminum skin over the transition zones and the cabin wall including a roof portion and two side wall portions; two support jacks mounted on the one cabin section and associated with the two side wall portions; means for adjustably positioning the support jacks transversely to the vehicle into an operating position outwardly adjacent the side walls of the vehicle, the jack positioning means comprising a transverse guide means arranged on the one cabin section, the guide means comprising a tubular carrier element of polygonal cross section mounted on the one cabin section and a respective tubular guide element telescopingly guide in the tubular carrier element, the guide elements having a first part telescopingly guided in the tubular carrier element and of circular cross section, and a second part carrying the support jacks and of polygonal cross section, the polygonal tubular carrier element being arranged to envelop the first and second parts of the guide elements and the tubular elements extending substantially perpendicularly to the side walls; and means for adjustably mounting and retaining the cabin on the vehicle.

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**4,314,727**

## ALL-PURPOSE WEATHER GUARD

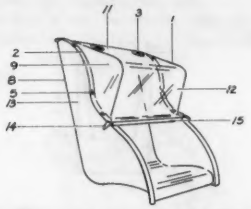
**James H. Potts, 220 S. 43rd St., Tacoma, Wash. 98408**

**Filed May 5, 1980, Ser. No. 144,484**
**Int. Cl.³ A47C *7/00***
**U.S. Cl. 297—184** **3 Claims**

1. A weather guard assembly for quick-releasable attachment to the forward face of the sides and top of a child's car seat, comprising in combination:

a transparent shatterproof guard having a top and front panel and two opposing sides, with their base of a configuration complementary to that of the corresponding sides of the child's car seat, and having a lip perpendicular to the sides and front of the guard, running its entire length and width, with a concave upper surface, ending at a flexible spout, protruding perpendicular to the side of the child's car seat, at the bottom front corners of the guard, and having the underside of the lip across the front panel covered with a padding material of suitable resiliancy;

a triple orifice air vent, at both rear corners of the guard top panel, with said openings having a common axis to which is rotatably attached an impervious cover, having openings cooperable with the openings in the guard top panel when aligned therewith and corresponding solid portions opposing the openings in the guard top panel when aligned therewith; and



means on the undersurface of the lips on the sides of said weather guard to quick-releasably attach the guard to a cooperable positioned means, permanently affixed to the forward face of the sides of the child's car seat, with said means regularly spaced along the sides of the car seat and correspondingly spaced along the undersurface of the lip on the sides of the guard.

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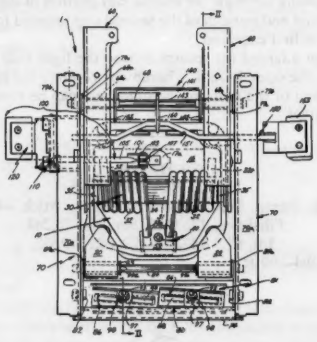
**4,314,728**

## CHAIR CONTROL

**Frederick S. Faiks, Greenville, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.**

**Filed May 1, 1980, Ser. No. 145,439**
**Int. Cl.³ A47C *3/00, 1/00***
**U.S. Cl. 297—300** **9 Claims**



1. In a synchrotilt chair control having a stationary control housing, resilient biasing means mounted in said stationary control housing, chair back support means pivotally mounted on said stationary control housing and operably interconnected with said resilient biasing means, and chair seat support means mounted on said stationary control housing and operably connected to said chair back support means for rearwardly tilting with said chair back support means, but at a different rate with respect thereto, against the biasing action of said resilient biasing means in response to a person leaning back in a chair to which said control is mounted, the improvement comprising: said chair seat support means having a forward portion located towards the front of a seat of a chair, when said control is mounted on a chair, and having a rearward portion located towards the rear of such a chair seat; said rearward

portion of said chair seat support means being pivotally connected directly to said chair back support means; said stationary housing including track means located towards the front thereof; said seat support means being slidably mounted in said track means at said forward portions of said seat support means, whereby said seat support means is free to shift relative to said stationary housing when a user tilts rearwardly in a chair mounted on such chair control yet whereby wear and tear on moving components is minimized by reason of said slidable interconnection between said chair seat support means and said stationary housing being located towards the front of said chair seat support means.

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4,314,729

## HINGE MOUNT FOR SEATS HAVING RECLINEABLE BACK RESTS, PARTICULARLY FOR MOTOR VEHICLE SEATS

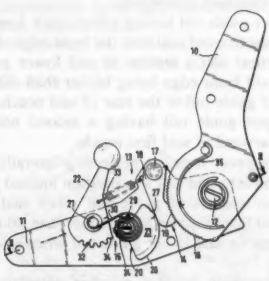
**Bernd Klueting, Radevormwald, Fed. Rep. of Germany, assignor to Keiper Automobiltechnik GmbH & Co. KG, Remscheid, Fed. Rep. of Germany**

**Filed Jun. 20, 1980, Ser. No. 162,036**

**Claims priority, application Fed. Rep. of Germany, Aug. 7, 1979, 2931915**

**Int. Cl.³ A47C *1/025***

**U.S. Cl. 297—366** **9 Claims**



1. A hinge mount for a seat having a reclineable back rest particularly a motor vehicle seat, said mount comprising a fixed hinge part assigned to the seat and a tiltable hinge part pivotably connected to the fixed hinge part and being assigned to the back rest; arresting means including a serrated segment arranged on said tiltable hinge part and a pawl pivotably mounted on said fixed hinge part opposite said serrated segment; a driven gear segment pivotably mounted on said fixed hinge part, said driven gear segment supporting for joint rotation a cam in the form of a spiral segment cooperating with said pawl, a spring arranged for rotating said driven gear segment together with said cam into an arresting position in which the spiral segment urges said pawl into engagement with said serrated segment; and control means including a driving gear engageable with said driven gear to rotate the same and said cam from said arresting position into a releasing position in which said pawl is disengaged from said serrated segment.

4,314,730

## MINERAL MINING MACHINE WITH HIGH PRESSURE FLUID NOZZLE AND INTENSIFIER

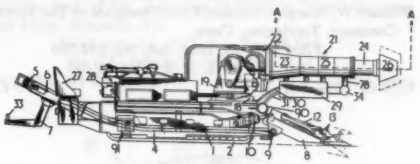
**Norman A. Plumpton, and Malcolm G. Tomlin, both of Burton-on-Trent, England, assignors to Coal Industry (Patents) Limited, London, England**

**Filed Mar. 14, 1979, Ser. No. 20,462**

**Claims priority, application United Kingdom, Mar. 17, 1978, 10657/78**

**Int. Cl.³ E21C *27/24, 37/06***

**U.S. Cl. 299—75** **2 Claims**



1. A mineral mining machine comprising:

a rotatable cutting head mounted on a rotatable shaft and having at least one pick mounted thereon and at least one high pressure water nozzle in the head;

boom means mounting said cutting head for swingable movement over a coal face including a rigid shaft and bearings therefore;

intensifier means for producing high pressure water at a pressure from 700 to 2100 $Kg/cm^2$, said intensifier means being directly connected to said boom means and movable therewith with a conduit within the rotatable shaft which connects to at least one conduit in the head leading to the nozzle.

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4,314,731

## CONTROL VALVE ASSEMBLY

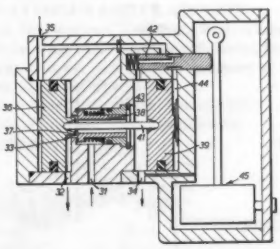
**Glyn P. R. Farr, Birmingham, England, assignor to Girling Limited, Birmingham, England**

**Division of Ser. No. 963,159, Nov. 22, 1978, Pat. No. 4,245,868. This application Apr. 30, 1980, Ser. No. 145,351**

**Claims priority, application United Kingdom, Nov. 25, 1977, 49051/77**

**Int. Cl.³ B60T *8/00***

**U.S. Cl. 303—24 A** **5 Claims**



1. A control valve assembly for a vehicle braking system, comprising an inlet, an outlet, a valve to control communication between said inlet and said outlet, a control member movable to open and close said valve, and inertia-responsive means responsive to deceleration of the vehicle to effect operation of said control member to reduce the pressure at said outlet after said valve has closed, said inertia-responsive means comprising an inertia responsive device which supplies a signal in dependence upon deceleration, and a force-applying means which applies a force to said control member in response to said signal to move said control member in a direction to reduce said outlet pressure, said force applying means comprising a servo-

system for amplifying said signal from said inertia responsive device, wherein said servo system comprises an auxiliary valve operable in response to movement of said inertia responsive device, a pressure operable member subjected to a pressure in dependence upon operation of said auxiliary valve, and means coupling said pressure operable member in force-transmitting relation with said control member, whereby said control member is subjected to a force which is dependent upon said deceleration.

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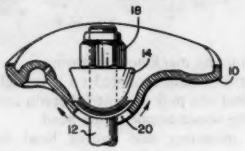
**4,314,732**
**OSCILLATING BEARING**
**William W. Murphy, Goshen, Conn., assignor to The Torrington Company, Torrington, Conn.**
**Filed May 23, 1980, Ser. No. 152,750**
**Int. Cl.³ F01L *1/18*; F16C *32/00***
**U.S. Cl. 308—2 R** **3 Claims**




1. An oscillating bearing for a stud comprising: an arcuate inner raceway; and arcuate outer raceway; and an arcuate retainer between said inner raceway and said outer raceway, the inner raceway, the outer raceway and the retainer having aligned openings for receiving a stud, said retainer having an arcuate roller pocket on each side of said opening and spaced from the opening, each roller pocket being long enough in the oscillating direction to receive a plurality of rollers; and a plurality of rollers in each pocket.

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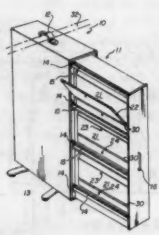
**4,314,733**
**SPECIALIZED FILING CABINET**
**Clark K. Smith, 5406 Wedding Ct., Waldorf, Md. 20601**
**Filed Sep. 19, 1979, Ser. No. 77,134**
**Int. Cl.³ A47B *63/00, 91/02***
**U.S. Cl. 312—183** **16 Claims**



1. A filing cabinet comprising: outer cabinet means, inner cabinet means, drawer means on said inner cabinet means to provide access to an inner filing area of said filing cabinet and plural stabilizer bars pivotally connected to a bottom face of said outer cabinet characterized by plural horizontal legs each pinned at an extremity thereof which when fanned out in a substantially horizontal plane form a cross-shaped support, wherein said inner cabinet means connected to said outer cabinet means through an open sided rectangular track placed on said outer cabinet, a T-shaped rail slideably disposed in said track and fastened to said inner cabinet, and inner cabinet formed as an open-sided rectangle and carrying said rails, wherein said drawer means comprises a rectangular box having upper truncated edge portions, said drawer means connected to said inner cabinet means through upper and lower track wheels carried on said drawer means fastened within upper and lower grooves on said inner cabinet.

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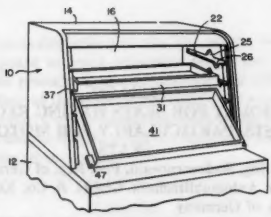
**4,314,734**
**CABINET DRAWER SUPPORT**
**Hans C. Grunert, Adelberg, Fed. Rep. of Germany, assignor to Sybron Corporation, Rochester, N.Y.**
**Filed May 7, 1980, Ser. No. 147,362**
**Int. Cl.³ A47B *88/18*; A47F *5/12***
**U.S. Cl. 312—322** **6 Claims**




1. In a system for supporting one or more drawers within a cabinet including upper and lower guide rails fixed within the cabinet to define a guide slot at each side of the cabinet, and support members projecting from the drawers and into the slots, the improvement comprising:

(a) said lower guide rail having a first notch formed therein adjacent the front of said slot, the front edge of said notch being vertical and a section of said lower guide rail in front of said front edge being higher than the section of said lower guide rail to the rear of said notch;

(b) said upper guide rail having a second notch therein spaced rearward of said first notch;

(c) a front support member projecting laterally from said drawer and into said slot at a position located just behind said higher section of guide rail when said drawer is closed, said front support being wider than said first notch so as to rest on said lower guide rail when said drawer is closed;

(d) an intermediate support member projecting laterally from said drawer and into said slot at a position behind the midpoint of said drawer, said intermediate support member being narrower than said first notch and adapted to drop into said first notch when said drawer is pulled outward from said cabinet to an open position;

(e) a rear support member projecting laterally from said drawer and into said slot adjacent the rear of said drawer, said rear support member being positioned with respect to said intermediate support member so as to pivot upwardly into said second notch when said intermediate support member drops into said first notch whereby the portion of said drawer pulled from said cabinet pivots downwardly about said intermediate support member to an inclined position; and

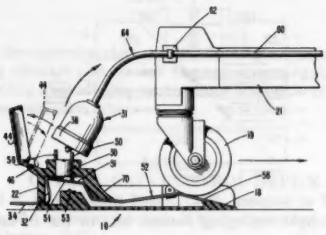
(f) the rear edge of said upper notch defining a guide ramp for controlling the pivotal movement of said rear support member about said intermediate support member and into said upper notch.

4,314,735

## BED LOCATOR HAVING AN INTEGRAL ELECTRIC SOCKET AND A PLUG EJECTOR

Eugene Fullenkamp, Batesville, and Dale Foster, Brookville, both of Ind., assignors to Hill-Rom Company, Inc., Batesville, Ind.

Filed Apr. 3, 1980, Ser. No. 136,505
Int. Cl.³ H01R 13/62
U.S. Cl. 339—45 R 13 Claims



1. A bed locator for use with a bed of the type which includes a leg to be removably retained by the locator and which carries electrically powered means having a first electrical connector, said locator comprising:

a second electrical connector electrically connectible to said first connector to connect the electrically actuable means to a source of electric power, and

disconnector means actuated in response to removal of said leg from the locator for disconnecting said first and second connectors.

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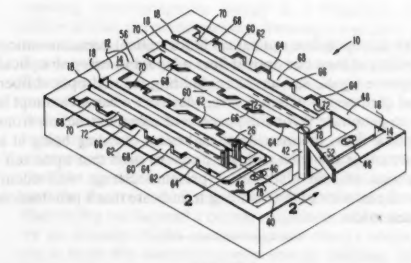
4,314,736

## ZERO INSERTION FORCE CONNECTOR FOR A PACKAGE WITH STAGGERED LEADS

Eugene F. Demnianiuk, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 24, 1980, Ser. No. 133,099
Int. Cl.³ H01R 13/62
U.S. Cl. 339—74 R 6 Claims



1. A zero insertion force connector for receiving an integrated circuit package with staggered leads, comprising:

a connector body defining a recess,

resilient conductive connector means for receiving and engaging said staggered leads to form an electrical contact therewith,

camming actuator means mounted in said recess,

camming means connected to said camming actuator means for sliding movement relative to said connector body on actuation of said camming actuator means, and

connector engaging means responsive to said camming means for moving transverse to the sliding movement of said camming means to cause said connector means to engage said staggered leads when inserted in said connector means,

said connector means actuating said connector engaging means for transverse movement to said camming means to move said engaging means out of engagement with said staggered leads or to receive said staggered leads.

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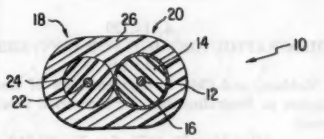
4,314,737

## CABLE ASSEMBLY HAVING SHIELDED CONDUCTOR AND METHOD OF MAKING SAME

Charles E. Bogese, Roanoke County, and Stephen B. Bogese, II, Roanoke, both of Va., assignors to Virginia Patent Development Corp., Roanoke, Va.

Filed Jun. 14, 1979, Ser. No. 48,636
Int. Cl.³ H01R 13/38; H01B 7/34
U.S. Cl. 339—99 R 18 Claims



1. A flat multi-conductor cable which comprises:

a conductive wire adapted to transmit an electrical signal;

cylindrical insulation covering said wire along its length;

means for shielding said wire against outside electrical interference which comprises a thin metallic layer of conductive material bonded to said insulation;

a ground wire having a cylindrical semi-conductive material covering same and in contact with said thin layer of conductive material along its length; and

an insulating jacket covering said semi-conductive material and said conductive material for maintaining physical and electrical contact therebetween;

wherein the outer diameters of said semi-conductive material and said conductive material are approximately the same so that said insulating jacket forms an easily terminated substantially planar multi-conductor cable array.

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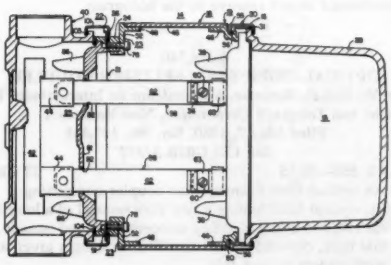
4,314,738

## AUXILIARY EQUIPMENT ENCLOSURE UNIT FOR WATTHOUR METER SOCKETS

Steven B. Davis, St. Mathews Township, Wake County, N.C.; Forrest E. Coyle, Penn Hills, and Denis E. Bedel, Ross Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 7, 1980, Ser. No. 128,222
Int. Cl.³ H01R 13/52; H02B 9/00
U.S. Cl. 339—156 R 19 Claims



1. An auxiliary equipment enclosure unit mountable at watthour meter sockets each having one of at least two detachable

meter mounting arrangements, said enclosure unit comprising: a hollow body defining a housing portion adapted to receive separate equipment devices therein; and an adaptive socket attachment assembly including a mounting extension extending axially from the rear end of said housing portion along an outer periphery circumscribing an area less than the vertical cross sectional area of said housing portion with said mounting extension including a recessed portion having opposed radial sides disposed in said mounting extension, and said adaptive socket attachment assembly further including a removable retainer means receivable over said extension and rotatably, positionable into said recessed portion so as to be axially confined by said radial sides and upon said enclosure unit being mounted to either one of the at least two meter mounting arrangements of the meter sockets, said retainer member is maintained in a predetermined radially overlapping relationship therewith for retaining said enclosure unit at the meter socket.

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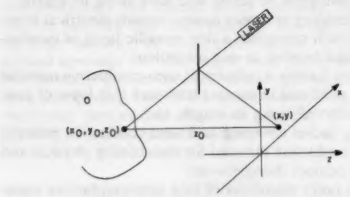
**4,314,739**

## HOLOGRAPHIC METHOD FOR CONVERSION OF WAVES

**Even Mehlum, and Odd Lovhaugen, both of Oslo, Norway, assignors to Sentralinstitutt for industriell forskning, Oslo, Norway**

**Filed May 25, 1979, Ser. No. 42,510**
**Claims priority, application Norway, May 30, 1978, 781868**
**Int. Cl.³ G03H *3/00***
**U.S. Cl. 350—3.66** **9 Claims**




1. A holographic method for converting a first wave which is emitted at a given wavelength from a first three dimensional object into a second wave which may be of another physical nature than said first wave and which is identical to, or approximately equal to, a wave that another, possibly scaled in size, but geometrically similar object would emit at a chosen wavelength which may be different from said given wavelength, said method comprising producing a hologram and, during such production, mixing said first wave with a reference wave whose wavefront in the hologram recording plane is different from that of the actual reconstruction wave in the same recording plane, and combining at least the phases of these two wavefronts so as to compensate for imaging errors due to mutual inconsistencies between the wavelength ratio, the hologram scaling and the object scaling, and any displacement of the reconstructed object relative to the hologram.

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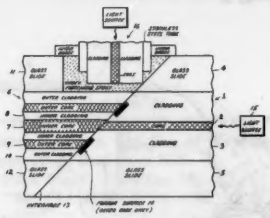
**4,314,740**

## OPTICAL FIBER BEAM SPLITTER COUPLER

**Gary W. Bickel, Roanoke, Va., assignor to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed May 7, 1980, Ser. No. 147,641**
**Int. Cl.³ G02B *5/172***
**U.S. Cl. 350—96.15** **22 Claims**

1. An optical fiber beam splitter coupler comprising:
a first optical fiber having a first core coaxial of a longitudinal axis and a first cladding concentric to and outside said first core, one end of said first fiber making a given angle with respect to said axis;
a second optical fiber having an inner core coaxial of said axis, an inner cladding concentric to and outside said inner core, an outer core concentric to and outside said inner cladding and an outer cladding concentric to and outside said outer core, one end of said second fiber making an angle with respect to said axis complementary to said given angle and abutting said one end of said first fiber to provide an interface therebetween;
a mirror surface disposed at said interface to cover the adjacent end of one of said inner core and said outer core to



reflect light impinging thereon into or out of said first fiber; and
a selected one of an input means and a utilization means in an operative relationship with said mirror surface, said input means providing light for reflection into said first fiber and said utilization means receiving light reflected out of said first fiber.

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**4,314,741**

## INTRUSION-FREE OPTICAL CABLE

**Czeslaw Deminet, and James F. Kenney, both of Kent, Wash., assignors to The Boeing Company, Seattle, Wash.**

**Filed Dec. 17, 1979, Ser. No. 104,476**
**Int. Cl.³ G02B *5/14***
**U.S. Cl. 350—96.33** **8 Claims**

1. An intrusion-free optical cable for optical communication comprising at least one optical fiber adapted to carry an optical intelligence signal, and an outer cladding for said optical fiber formed of materials which will self-destruct when an attempt is made to penetrate it for the purpose of signal extraction from the optical fiber, the interior of said outer cladding being at a pressure other than the ambient pressure such that upon self-destruction of said cladding, a pressure change will occur within the interior of the cladding to indicate that a penetration has been made.

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**4,314,742**

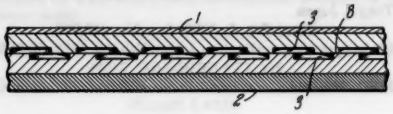
## HIGH PERFORMANCE COOLED LASER MIRROR

**John A. Dye, Lake Park, and Peter E. Weber, North Palm Beach, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Jun. 2, 1980, Ser. No. 155,737**
**Int. Cl.³ G02B *5/08***
**U.S. Cl. 350—310** **6 Claims**

1. A high power, cooled, laser mirror comprising:
a mirror surface;
a heat exchanger in heat transfer communication with the mirror surface;
the mirror surface and the heat exchanger supported on a mirror substrate; wherein the heat exchanger contains

fluid cooling channels formed by, in combination, the opposing cooling channels of a first plate and second plate, the cooling channels in each plate being angularly offset with respect to the nearest adjacent cooling channel



of the opposing plate thereby forming a criss-cross cooling channel pattern and the opposing, angularly offset cooling channels disposed in direct fluid flow communication with each other.

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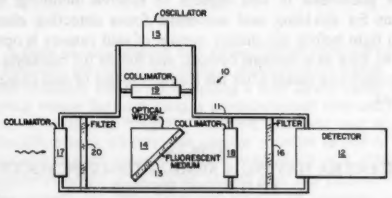
**4,314,743**

## OPTICAL GAIN CONTROL DEVICE

**Howard E. Rast, Solana Beach, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Nov. 19, 1979, Ser. No. 95,869**
**Int. Cl.³ G02B 5/23**
**U.S. Cl. 350—354** **17 Claims**




1. An apparatus for automatically limiting high energy bursts of monitored electromagnetic energy from impinging on a processing device such as a photodetector comprising:

means located to intercept monitored electromagnetic energy for providing responsive radiation levels that project onto the processing device when signals of a predetermined frequency impinge thereupon and

means disposed adjacent the radiation providing means for emitting electromegnetic energy in a frequency range different than the predetermined frequency signals to raise an excitation state of the radiation providing means to a first level in a given concentration to assure that the radiation providing means projects responsive radiation levels onto the processing device, the radiation providing means includes a fluorescent material having the property of being raised to a first lower excitation state when the electromagnetic energy in a frequency range different than the predetermined frequency signals impinges on it and the fluorescent material further has the property of fluorescing not beyond a certain magnitude as determined by an intensity of the electromagnetic energy impinging on it from the electromagnetic energy emitting means irrespective of magnitudes of said predetermined frequency signals.

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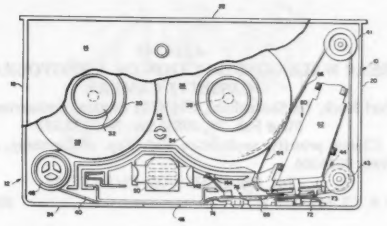
**4,314,744**

## MULTIPURPOSE FILM HANDLING CASSETTE HAVING PRELIMINARY ASSEMBLY CONDITION

**Donald E. Moodie, Marblehead, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Aug. 22, 1980, Ser. No. 180,375**
**Int. Cl.³ G03C 11/00**
**U.S. Cl. 352—130** **4 Claims**

1. In a multipurpose film handling cassette of the type having a housing containing for exposure and processing a strip of photographic film, said housing also containing a modular fluid processing means; said modular fluid processing means comprising a fluid reservoir filled with processing fluid, said reservoir being initially sealed by a releasable tear tab closure which is removable from said reservoir after film strip exposure for deposition of the processing fluid on the film strip during movement of the film strip along a given path; said processor having a fluid deposition nozzle supported in spaced relation with said reservoir with said tear tab closure initially positioned therebetween, said modular processing means having a fixed final assembly condition within the cassette housing in which a part of said nozzle and one or more other components of said processing means are in positive contact with a portion of said film strip lying in said given path, the improvement comprising:



structural support means within said cassette housing for supporting said modular processor in a preliminary assembly position wherein said nozzle and said one or more other components of said modular processor are spaced from said given path of said film strip, thereby facilitating threading of the film strip therepast, said modular processor being displaceable responsive to an external force from said preliminary assembly position to a final position wherein said nozzle and said one or more other components of said modular processor are in engagement with said film strip following threading of the film strip therepast, thereby putting said modular processing means it its fixed final assembly condition.

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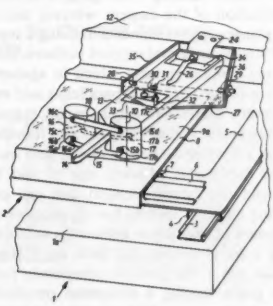
**4,314,745**

## MICROFILM READING DEVICE

**Günter Freiberg, Munich, Fed. Rep. of Germany, assignor to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany**

**Filed Mar. 18, 1980, Ser. No. 131,356**
**Claims priority, application Fed. Rep. of Germany, Mar. 21, 1979, 2911090**
**Int. Cl.³ G03B 21/11**
**U.S. Cl. 353—101** **14 Claims**



1. In a microfilm reader of the type having a film table for supporting a microfilm and a light source behind the film table

so that the light rays pass through the microfilm in a predetermined path, a combination comprising a lens carrier above the film table; a pair of projecting lenses mounted on said carrier; means mounting said carrier for pivotal movement about an axis inclined to said predetermined path between two end positions in each of which a different one of said lenses is interposed in said path; a H-shaped support having a cross bar fixed to the lens carrier and two longitudinal bars each having two ends, each of said ends being provided with a tab; and a number of pins arranged on the respective projecting lenses at a distance from each other for engaging with the respective tabs, so that said projecting lenses are resiliently fixed and supported in a floating manner.

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**4,314,746**

## REAR WALL CONSTRUCTION OF A PHOTOGRAPHIC CASSETTE CAMERA

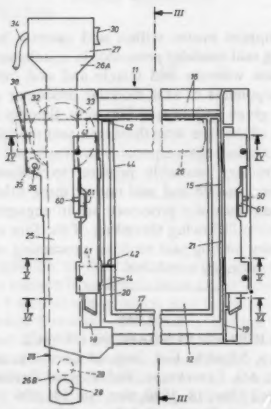
**Carl Koch, Im Santenbuhl, CH-8211 Stetten, Switzerland**

**Filed Feb. 25, 1981, Ser. No. 237,953**

**Claims priority, application Fed. Rep. of Germany, Jul. 11, 1980, 3026306**

**Int. Cl.³ G03B *7/08, 17/26, 17/02***

**U.S. Cl. 354—23 R** **10 Claims**



1. In a photographic cassette camera having a cassette guide frame and an attachable ground-glass frame supporting a ground-glass for observation of a subject to be photographed, one of said frames defining an image field of the camera, a rear wall construction of the camera wherein said cassette guide frame has planar support elements defining a support plane and being surrounded by lateral support surfaces, said ground-glass frame having support runners which fit against said elements for mounting the ground-glass parallel to said support plane at a focal distance therefrom, a bar-shaped exposure measuring probe having at one end an opto-electric transducer and being mounted on a holding device on one of said frames for sliding and pivotal movement adjacent one of said lateral support elements, said one lateral element and one of said support runners lying adjacent thereto having recesses therein permitting movement of said probe between a selectively adjustable measuring position within the field on a front side of the ground-glass and a rest position completely out of the image field, said probe having a dimension perpendicular to said planar support elements which exceeds said focal distance, said probe engaging said recesses whenever it is adjusted for a measuring position.

**4,314,747**

## LIGHT SHIELDING DEVICE FOR AUTOMATIC FOCUS DETECTING

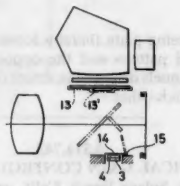
**Keisuke Haraguchi, Ranzan, and Harumi Aoki, Kiyose, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 5, 1980, Ser. No. 118,700**

**Claims priority, application Japan, Feb. 16, 1979, 54-18642[U]**

**Int. Cl.³ G03B *3/00, 7/099***

**U.S. Cl. 354—25** **6 Claims**



1. A light shielding device of an automatic focus detecting element in an automatic focus detecting device of a single-lens reflex camera comprising: an automatic focus detecting element positioned in said camera to receive incoming light; means for shielding said automatic focus detecting element from light before the shutter curtain of said camera is opened and so long as it remains opened; and means for releasing said light shielding means after the shutter curtain of said camera is closed.

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**4,314,748**

## CAMERA HAVING A SEMI-AUTOMATIC FOCUS ADJUSTING DEVICE

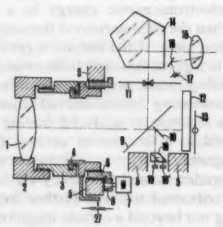
**Takashi Kawabata, Kamakura; Kazuyas Hosoe, Machida; Nobuhiko Shinoda, Tokyo; Shinji Sakai, Tokyo, and Takao Kinoshita, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed May 19, 1980, Ser. No. 151,100**

**Claims priority, application Japan, May 23, 1979, 54-63374**

**Int. Cl.³ G03B *3/10***

**U.S. Cl. 354—25** **22 Claims**



12. For use with a photographic optical system having at least a portion manually movable along an optical axis for focusing from close-up to infinity when used with a camera body, a camera body comprising:

(a) film receiving means for receiving film and defining a focal plane;

(b) automatic adjusting means for displacing the manually movable portion along the optical axis from its manually adjusted position over a given range less than the overall range needed to focus from close-up to infinity when the optical system is used with the body, said adjusting means including a motor;

(c) focus control means for detecting the focused condition of an image on the focal plane and for driving the motor

to displace the portion toward a focused condition within the given range when the optical system is used with the body;

(d) said control means including reset means for resetting the portion to a predetermined intermediate position in the given range.

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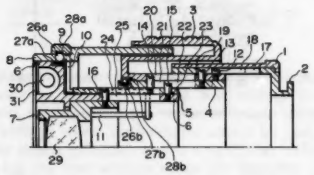
**4,314,749**

## LENS MOUNT BARREL FOR PHOTOGRAPHING WITH FLASH LAMP

**Shinsuke Komoto, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 24, 1980, Ser. No. 171,782**
**Claims priority, application Japan, Jul. 25, 1979, 54-94596**
**Int. Cl.³ G03B *15/03, 9/02***
**U.S. Cl. 354—139** **7 Claims**



**5.** A flash photographing lens mount barrel comprising:

first rotatable means for adjusting a magnification value;

second rotatable means for adjusting a stop down value; and

coupling means for providing a predetermined non-unity degree of rotational coupling between said first and second rotatable means whereby an angular rotation of one of said first and second rotatable means will result in a different angular rotation of the other of said first and second rotatable means, said predetermined degree of coupling being selected to maintain a desired relationship between said magnification and stop down values.

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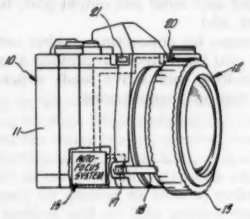
**4,314,750**

## TACTILE INDICATION AND CONTROL SYSTEM

**John M. Orban, Santa Monica, Calif., assignor to Vivitar Corporation, Santa Monica, Calif.**

**Filed Jan. 12, 1981, Ser. No. 224,076**
**Int. Cl.³ G03B *3/00, 9/02, 17/18***
**U.S. Cl. 354—198** **14 Claims**



**1.** A tactile indicator and control system for a camera for providing a tactile indication to the camera operator upon the occurrence of a desired exposure condition comprising

camera apparatus for forming images of objects to be recorded, said camera apparatus having adjusting means movable over a range of positions by the hand of the operator for varying said exposure condition,

control system means including sensor means for sensing the exposure condition and providing an electrical signal indicative that a desired state of the exposure condition has occurred, and

electromechanical means responsive to said electrical signal for physically affecting said adjusting means in a manner to impart to the hand of the operator a tactile indication that the desired exposure condition has occurred.

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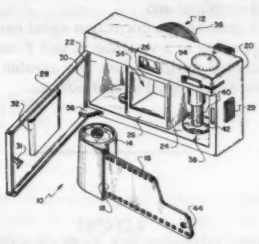
**4,314,751**

## TAKE-UP SPOOL ADVANCING MECHANISM FOR A PHOTOGRAPHIC CAMERA

**Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jan. 12, 1981, Ser. No. 223,956**
**Int. Cl.³ G03B *1/06***
**U.S. Cl. 354—212** **5 Claims**



**1.** In a photographic camera adapted for use with a supply of strip film, the camera having (1) a housing, (2) a film take-up spool rotatably mounted in the housing and provided with a film attaching means for securing the leading end of the film to the take-up spool, and (3) a cover door hinged to the housing and movable between an open position wherein the camera interior is accessible for loading and unloading a film supply and a closed position, the improvement comprising:

take-up spool rotating means interconnecting the cover door and the take-up spool and (1) responsive to movement of the cover door to its open position for rotating the take-up spool to a predetermined rotational position to thereby orient the film attaching means for securing the leading end of the film supply to the take-up spool, and (2) responsive to movement of the cover door to its closed position for rotating the take-up spool through a predetermined angle to thereby wind film on the take-up spool.

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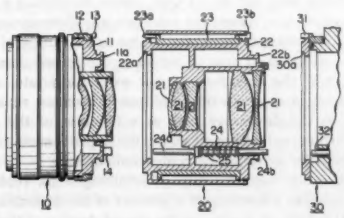
**4,314,752**

## MOUNT DEVICE OF A FOCAL LENGTH CHANGING AUXILIARY LENS

**Sunao Ishizaka, and Toshiaki Hozumi, both of Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan**

**Filed Aug. 28, 1980, Ser. No. 182,070**
**Claims priority, application Japan, Sep. 17, 1979, 54/126840[U]**
**Int. Cl.³ G03B *7/20, 9/02***
**U.S. Cl. 354—286** **9 Claims**



**1.** In an auxiliary lens capable of being mounted between an objective lens having on the mount thereof means for generat-

ing a minimum F-number signal and a camera including means for detecting said signal on a mount to which said objective lens may be mounted and a circuit receiving as input the detected signal and information based on the light passed through said objective lens to effect an exposure operation, a composite focal length of the objective lens with said auxiliary lens being different from the focal length of said objective lens, the improvement comprising:

transmitting means capable of being coupled to each of said minimum F-number signal generating means and said detecting means when the auxiliary lens is mounted between said camera and said objective lens, said transmitting means transmitting said signal to said detecting means by said coupling; and

means for generating a correction signal having information corresponding to a variation in said F-number caused by the mounted auxiliary lens and capable of transmitting said correction signal to said circuit.

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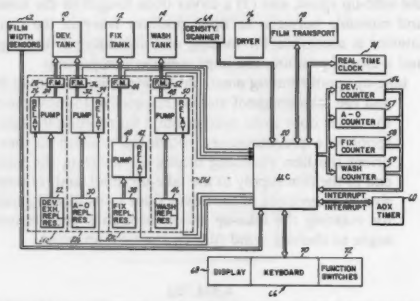
**4,314,753**

## AUTOMATIC INVERSE FIX REPLENISHER CONTROL

**Kenneth M. Kaufmann, Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.**

**Filed Jul. 14, 1980, Ser. No. 168,025**
**Int. Cl.³ G03D *3/06***
**U.S. Cl. 354—321** **4 Claims**




1. In a processor of strips of photosensitive material having a developer tank for containing developer fluid; a fix tank for containing fix fluid; a wash tank for containing wash fluid; a dryer for drying the strips; means for sequentially transporting the strips through the developer tank, the fix tank, the wash tank, and the dryer; means for determining area of a strip transported through the processor; means for sensing density of the strip after the strip has been transported through the developer tank and the fix tank; means for storing a developer exhaustion rate; means for automatically determining a developer exhaustion replenishmen value as a function of a product of the determined area of the strip, the sensed density of the strip, and the stored developer exhaustion rate; means for supplying a quantity of developer exhaustion replenishment fluid to the developer tank as a function of the developer exhaustion replenishment value; the improvement comprising:

means for storing a fix replenishment rate;

means for automatically determining a fix replenishment value as a function of a product of the determined area of the strip, an inverse of the sensed density of the strip, and the stored fix replenishment rate; and

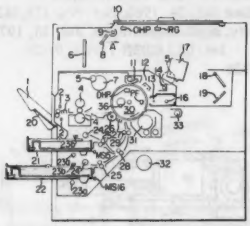
means for supplying a quantity of fix replenishment fluid to the fix tank as a function of the fix replenishment value.

**4,314,754**

## IMAGE FORMING APPARATUS

**Katsuichi Shimizu, Tokyo; Osamu Sawamura, Atsugi; Shunichi Masuda, Tokyo; Masahiro Tomosada, Kawasaki, and Hisashi Sakamaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 1, 1978, Ser. No. 882,626**
**Claims priority, application Japan, Mar. 2, 1977, 52-22982**
**Int. Cl.³ G03G *15/00***
**U.S. Cl. 355—14 C** **20 Claims**



1. An image forming apparatus having

(a) active loads for forming an image upon a recording medium,

(b) input means for entering copying operation instruction and sense signals,

(c) control means for controlling said active loads in response to the signals from said input means, said control means consisting of a semiconductor element including first memory means for storing therein a program for sequentially controlling said active loads, second memory means for storing therein input data, a processing unit for processing said input data and said program,

input ports for receiving the signals from said input means, and

output ports for providing control signals to said active loads, wherein at least one of said output ports provides a latch signal during the time of operation of one of the active loads,

said first and second memory means, said processing unit and said input and output ports being integrally formed, and

(d) gate means for connecting another one of the active loads to said latch signal to provide a said output port for controlling said active loads which are larger in number than said output ports.

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**4,314,755**

## BIAS VOLTAGE CONTROLLED DEVELOPING SYSTEM IN AN ELECTROPHOTOGRAPHIC COPYING MACHINE

**Hiroshi Kinashi, Uji, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Oct. 29, 1979, Ser. No. 89,235**
**Claims priority, application Japan, Oct. 31, 1978, 53-134976**
**Int. Cl.³ G03G *15/00***
**U.S. Cl. 355—14 D** **10 Claims**

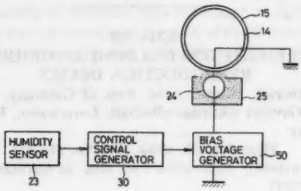
4. A developing system for developing an electrostatic latent image formed on a photosensitive material in a copying machine, said photosensitive material having an insulator layer formed thereover, said developing system comprising:

a developing device for applying a toner to said electrostatic latent image formed on said photosensitive material;

bias voltage application means for applying a bias voltage between said developing device and said photosensitive material;

humidity sensor means for sensing the humidity in said copying machine;

control signal generator means for developing a control signal in accordance with the humidity sensed by said humidity sensor means; and




bias voltage variation means responsive to said control signal for varying the level of said bias voltage in response thereto, said bias voltage variation means increasing the bias voltage when the humidity sensed by said humidity sensor means increases above a particular value and decreasing the bias voltage when the humidity sensed by said humidity sensor means decreases below said particular value.

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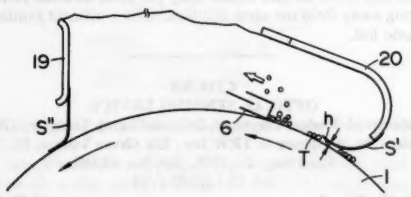
**4,314,756**

## CLEANING DEVICE

**Joji Amitani, Yokohama; Takashi Ito, Kawasaki, and Kazuhiro Hirayama, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 30, 1979, Ser. No. 70,983**
**Claims priority, application Japan, Sep. 1, 1978, 53-107881**
**Int. Cl.³ G03G *21/00***
**U.S. Cl. 355—15** **14 Claims**




1. A cleaning device for removing developer remaining on an image bearing member, which comprises an elastic cleaning blade contacting the image bearing member, hood means for covering the vicinity where the blade bears against the image bearing member, means for creating a suction within said hood means, and means for guiding air flow to strike against said blade bearing portion, said air flow guiding means having a sheet like member which is of a flexible material.

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**4,314,757**

## PHOTOGRAPHIC PRINTER WITH AUTOMATIC PAPER SPLICE DETECTOR

**Richard D. Anderson, Maple Grove; Jess F. Fauchier, II, Crystal, and Francis M. Laciak, Brooklyn Park, all of Minn., assignors to Pako Corporation, Minneapolis, Minn.**

**Filed Sep. 11, 1980, Ser. No. 186,215**
**Int. Cl.³ G03B *29/00, 27/52***
**U.S. Cl. 355—29** **5 Claims**

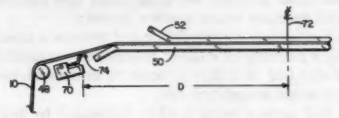
1. A photographic printer of the type in which photographic images are recorded on a web of photographic paper, and in which the photographic paper web may contain a paper splice, with a splice warning slot preceding the splice, the photographic printer comprising:

means for defining a printing aperture;

paper feed means for advancing the photographic paper web a predetermined feed length during each paper feed cycle to advance an unexposed portion of the web to the printing aperture;

exposure means for exposing the web at the printing aperture to record a photographic image during each exposure cycle;

splice sensor means positioned along the path of the web upstream from the printing aperture for sensing the presence of the splice warning slot and providing a signal indicative of the presence of a paper splice in the web; and




control means for controlling the paper feed means and the exposure means in response to a signal from the splice sensor means to cause the paper splice to be advanced past the printing aperture by moving the print paper in integral feed lengths without a photographic image being recorded on a portion of the web containing the paper splice, wherein the control means determines the number of paper feed cycles which can be completed before the splice warning slot reaches the printing aperture, and permits normal operation of the printer until the determined number of exposure and paper feed cycles has been completed; and then advances the paper, while inhibiting exposure cycles, by causing the paper feed means to initiate an additional number of paper feed cycles to advance the paper splice past the printing aperture.

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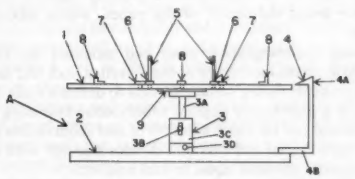
**4,314,758**

## SPECIAL EFFECTS PHOTOGRAPHIC PRINTING EASEL ARRANGEMENT

**William E. Kazierod, 130 E. Bernice Dr., Northlake, Ill. 60164**

**Filed Nov. 15, 1978, Ser. No. 960,920**
**Int. Cl.² G03B *27/52***
**U.S. Cl. 355—40** **8 Claims**




1. A photographic printing easel device comprising:

a circular bed mounted for rotational movement about its central axis and defining a generally planar top surface against which photographic printing paper may be laid,

means for indexing the printing paper centrally of the bed when the paper is applied thereto in its exposing position,

a mask of circular form having its outer rim edge of a diameter less than that of said bed,

said bed having on said surface a plurality of indexing elements radially spaced about said bed and at equal distances from said bed axis, which distances equal the radius of said mask,

said indexing elements being formed on their sides facing said axis to comprise said indexing means and including means for seating the printing paper against said bed sur-

face and in movement restraining relation with said indexing elements when the printing paper is applied in its exposing position,

said indexing elements being further formed to define like coplanar seating lands paralleling and above said bed surface and like upstanding outer guide walls struck on an arc that complements that of said mask edge for seating the mask on said bed over the printing paper, when in its exposing position, in engagement with said seating lands and between said guide walls for journalling the mask on the bed for rotational movement about said bed axis, relative to said bed,

said mask being formed from light opaque material and being shaped to define an open sector defining spaced apart side edges that are radially disposed with respect to said mask and that are at an angle that divides into 360 with an equal whole number quotient,

said bed surface having delineated thereon a scale comprising a plurality of angular subdivisions extending radially of said bed of which adjacent of said subdivisions are at said angle at said bed axis,

said bed surface being further delineated to define a zero datum extending radially of said bed surface and bisecting the space between two of said angular subdivisions to form an initial printing position of said bed with which said mask sector may be aligned for photographic printing exposure purposes over the printing paper by aligning the mask sector side edges with those of said angular subdivisions next adjacent to said datum zero on either side of said datum zero,

and a datum marker adjacent the bed rim with which said bed surface angular subdivisions may be consecutively aligned to orient said bed and said mask at consecutive printing positions of said bed corresponding in number to said quotient number,

whereby the printing paper may have applied thereto consecutively in a circular pattern about said bed axis a number of images equal in number to said quotient number by, after one of said image exposure has been made on the paper, consecutively shifting said easel about its axis in one direction about said axis to consecutively dispose said angular subdivisions in alignment with said datum marker and then shifting said mask about said axis in the other direction to expose through the mask sector the next adjacent sector of the printing paper that is to have the next image to be applied thereto.

8. The method of forming a plurality of images of a predetermined number on photographic printing paper in a circular manner about the center of the paper, which method comprises:

taking a photographic easel bed mounted for rotational adjustment movement about a vertical axis and having an upwardly facing surface formed to define a scale comprising a plurality of angular subdivisions extending radially of said bed of which adjacent of said subdivisions are at an angle at said bed axis that divides into 360 with a whole number quotient equal to said number,

said bed surface being further delineated to define a zero datum extending radially of said bed surface and bisecting the space between two of said angular subdivisions to form an initial printing position of said bed,

applying the printing paper on the bed in centered relation thereto,

taking a circular mask proportioned to cover said paper and formed to define an open sector defining spaced apart side edges that are radially disposed relative to the mask and at said angle with respect to each other, and shiftably positioning said mask on the bed over the paper in said initial printing position with the mask axis aligned with the bed axis, and the mask sector aligned with said one angular subdivision, by aligning the mask sector side edges with those of said angular subdivisions next adjacent to said datum zero on either side of said datum zero,

making the initial printing exposure on the paper through the mask sector,

and then consecutively shifting the easel bed about its axis in one direction to consecutively dispose said angular subdivisions in alignment with a stationary datum marker, shifting the mask about said axis in the other direction to expose through the mask sector the next adjacent sector of the paper that is to have the next image to be applied thereto, and forming such image on the paper to complete the formation of said number of images on said paper.

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**4,314,759**

## PLATE ELEMENT FOR HOLDING AN ORIGINAL, IN A REPRODUCTION DEVICE

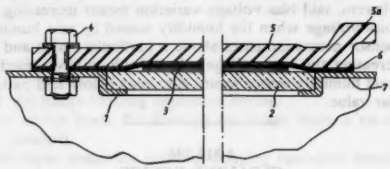
**Heinz Webersik, Munich, Fed. Rep. of Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Jan. 30, 1980, Ser. No. 116,873**

**Claims priority, application Fed. Rep. of Germany, Feb. 23, 1979, 2907037**

**Int. Cl.³ G03B *27/62***

**U.S. Cl. 355—75** **7 Claims**




1. A plate element for holding an original in a reproduction device, comprising a flexible body part having a lower surface facing toward an original; and means forming a light-colored upper reflecting face on said lower surface of said body part, said forming means including a light-reflecting white paper layer which has an inner surface facing toward and connected with said lower surface of said body part, and an outer surface facing away from the same and lined with a pellucid synthetic plastic foil.

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**4,314,760**

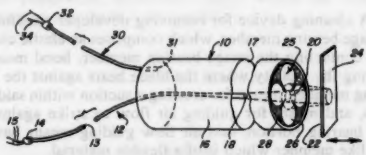
## OPTICAL SENSING DEVICE

**Malcolm H. Hodge, Claymont, Del., and Leroy Tabb, Jr., Glenside, Pa., assignors to TRW Inc., Elk Grove Village, Ill.**

**Filed Aug. 27, 1979, Ser. No. 69,680**

**Int. Cl.³ G01C *3/08***

**U.S. Cl. 356—4** **14 Claims**




1. In an optical sensing system for measuring distances to a light-reflecting surface to be sensed, the combination comprising a light source for emitting a cone of light signal to a light-reflecting surface to be sensed; light-sensitive means for translating light received from a light-reflecting surface into signals corresponding to the light quantity received; light-masking means positioned between a light-reflecting surface to be sensed which is disposed on one side of said light-masking means, and said light-sensitive means which is disposed on the other side of said light-masking means and positioned a designed distance from said light sensitive means; said light-masking means having a first translucent area through which said

cone of light and light reflecting from a light-reflecting surface to be sensed pass; said masking means having a second area surrounding said first area which is partially translucent for allowing a portion only of reflected light striking the same to pass therethrough to said light-sensitive means; said second area also having an opaque portion predeterminately formed for masking out increased quantities or reflected light with increased light-masking means to reflecting surface distance until the reflected light from such light-reflecting surface extends beyond the outer periphery of said masking means such that the quantity of reflected light reaching said light sensitive means varies as a predesigned function of the distance between said masking means and such reflecting surface.

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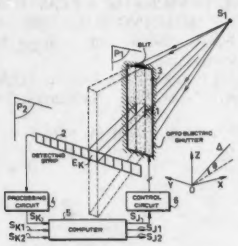
## 4,314,761
## ARRANGEMENT FOR LOCATING RADIATING SOURCES

**Jean C. Reymond; Jean L. Hidalgo, and Claude Skenderoff, all of Paris, France, assignors to Thomson-CSF, Paris, France**

**Filed Apr. 1, 1980, Ser. No. 136,333**
**Claims priority, application France, Apr. 6, 1979, 79 08786**
**Int. Cl.³ G01B *11/26*; G02F *1/03***
**U.S. Cl. 356—141** **8 Claims**



1. A sensor system for location of radiation sources comprising:

an optical mask for allowing penetration of radiation from the source solely along transparent zones of predetermined shape;

detection means constituted by linear detecting arrays of photo-sensitive elements disposed in a detection plane parallel to the mask for detection of the said source radiation transmitted through the said transparent zones;

circuits for processing the signals detected by said linear arrays and producing control signals identifying the positions of elements sensitized by the radiation transmitted through the mask;

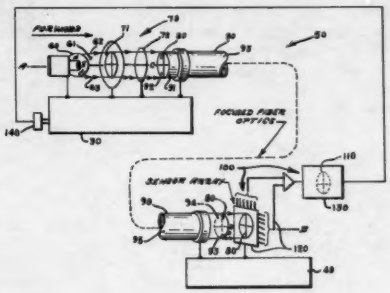
ancillary computing means for computing the source location from the said position identifications;

optoelectrical shutter means for dividing each of the transparent zones into juxtaposed regions and for opacifying said zones except the regions which substantially transmit light from the said radiation source to the said detection plane solely onto photosensitive elements of the said linear arrays, said optoelectrical shutter means comprising electrically controlled optical shutter elements which correspond to said regions respectively and selection means for selecting shutter elements corresponding to the said transmitting regions by means of said control signals produced by the said computing means.

## 4,314,762
## FOCUSED, SINGLE STRAND, OPTICAL FIBER ROTATIONAL ALIGNMENT IMAGE-SENSING AND COMPARING SYSTEM

**Laurence S. Gresko, Long Beach, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed May 30, 1980, Ser. No. 154,718**
**Int. Cl.³ G01B *11/26***
**U.S. Cl. 356—150** **4 Claims**



1. A focused, single strand, optical fiber rotational alignment image-sensing and comparing system for determining if a first member and a second member are rotationally aligned, wherein this system has an optical axis, comprising:

a. a light source attached to said first member and emitting a light beam;

b. means for intercepting said emitted light beam, forming an image with said intercepted beam, and transmitting said formed image, wherein this means is attached to said first member and is disposed forward of and in optical alignment with said emitted light beam;

c. a single strand of focused optical fiber having an optical axis coincident with said optical axis of this rotational alignment image-sensing and comparing system, a first end with a flat face thereat that is perpendicular to said axis, a second end with another flat face that is perpendicular to said axis, a peripheral surface, and a parabolic refractive index which is largest at said axis and continuously decreases toward said peripheral surface, wherein this single strand of focused optical fiber is attached at said first end to said first member and is attached at said second end to said second member, and wherein said single strand of focused optical fiber is disposed forward of and in optical alignment with said light beam-intercepting and image-forming and transmitting means, and also wherein said signal strand of focused optical fiber is concurrently disposed such that said flat face at said first end thereof is in optical alignment with said light beam-intercepting and image-forming and transmitting means, thereby said image transmitted by this means impinges upon said first end flat face, is transmitted through this single strand of focused optical fiber to said second end flat face thereof, and is emitted from and is transmitted at said second end flat face;

d. and, means for sensing said formed image that is emitted from and is transmitted at said second end flat face of said single strand of focused optical fiber, and for comparing this emitted and transmitted formed image to a stored identical image whose rotational position, relative to said optical axis of this rotational alignment image-sensing and comparing system, has been preselected to indicate correct alignment of said first and second members;

whereby a rotational displacement of said formed image as compared to said stored image can be ascertained, and

thereby a rotational mis-alignment of said first member as compared to said second member can be determined.

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**4,314,763**

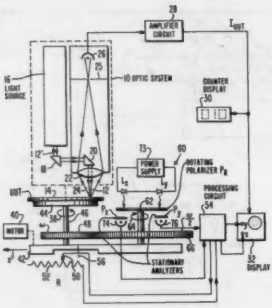
## DEFECT DETECTION SYSTEM

**Edgar F. Steigmeier, Hedingen, and Karl Knop, Zurich, both of Switzerland, assignors to RCA Corporation, New York, N.Y.**

**Filed Jan. 4, 1979, Ser. No. 813**

**Int. Cl.³ G01N *21/88***

**U.S. Cl. 356—237** **13 Claims**




1. In a system for optically detecting microscopic defects in a certain specularly reflecting surface of a given object, said system comprising first means for scanning said surface with an incident beam of light that illuminates a relatively small spot area of said entire surface area, which spot area is large relative to the area of any microscopic defect, and second means for detecting substantially only non-specularly reflected light from said surface; the improvement:

wherein said first means includes third means for directing said incident beam substantially normal to said surface, whereby substantially all said specularly reflected light is reflected in a direction substantially normal to said surface, and

wherein said second means includes a focusing device having a large aperture area relative to said spot area, said device being situated in spaced relationship with said spot area to subtend a certain solid angle disposed about a normal to said spot area, whereby substantially all reflected light within said certain solid angle may be captured by said device, and

wherein said second means further includes a photo detector located in an image plane of said device for receiving light reflected by said surface, and a spatial filter having a small aperture area relative to that of said device situated between said device and said detector in the path of said received reflected light for removing that portion thereof which is specularly reflected.

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**4,314,764**

## CHEMICAL ANALYSIS SAMPLE CONTROL

**Peter R. Liddell, North Bayswater; Antony S. Pearl, desceased, late of Griffith, Australia, and by Edmund Calvert, administrator, Canberra, Australia, assignors to Varian Tectron Party Ltd., Victoria, Australia**

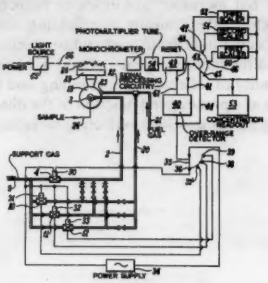
**Filed Oct. 17, 1978, Ser. No. 952,176**

**Claims priority, application Australia, Oct. 18, 1977, PD2098**

**Int. Cl.³ G01N *21/72***

**U.S. Cl. 356—315** **22 Claims**

1. A method of controlling dilution of sample concentration for spectroscopic analysis of a sample including the steps of, receiving light in a photodetector characteristic of said sample, feeding a sample in liquid concentrate form to a nebulizer, said sample including an element of interest, feeding a support gas under pressure to the nebulizer to nebulize said sample and to carry the nebulized sample into an analysis zone, and controlling the flow of said support gas to said nebulizer to regulate the rate of said sample to said analysis zone and to thereby control the density of atoms of said element present in said analysis zone so as to be within a measurable range, controlling




said flow of support gas to said nebulizer in response to said photodetector response, said control providing division of said support gas before said nebulizer so that part of said support gas only influences the uptake of said sample at said nebulizer, and the remainder of said support gas flow is fed to said analysis zone through a pass by-passing said nebulizer.

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**4,314,765**

## DEGASSER ON A WORM-TYPE MELTING AND CONVEYING DEVICE FOR A PLASTIC INJECTION MOLDING MACHINE

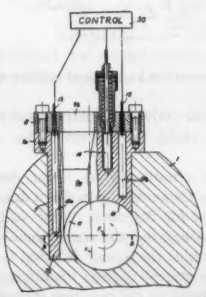
**Alfons Hotz, Näfels, Switzerland, assignor to Netstal-Maschinen AG, Switzerland**

**Filed Feb. 15, 1980, Ser. No. 121,980**

**Claims priority, application Switzerland, Mar. 7, 1979, 2204/79**

**Int. Cl.³ B29B *1/10***

**U.S. Cl. 366—75** **5 Claims**



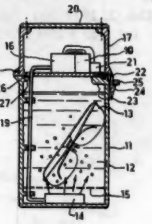

1. In a melting and conveying device for a plastic injection molding machine, having a melting cylinder with a cylindrical bore therein and a worm member in the cylindrical bore, a degasser, comprising, a vent pin extending into the melting cylinder in a degassing zone of the cylindrical bore, said vent pin having a charging pocket communicating with the cylindrical bore and a vent opening communicating the pocket with the atmosphere, and heat means connected to said vent pin for heating the pocket and vent opening separately of any other heating in the plastic injection molding machine, said heat means comprising at least one heating element extending into said vent pin parallel to a major axis of said vent pin, said heating element extending into the vicinity of said charging pocket.

4,314,766

## SPECTACLE CLEANING DEVICE FOR DOMESTIC USE

Guy Lapeyre, Paris, and Jean Thiebaut, Creteil, both of France, assignors to Essilor International (Compagnie Generale d'Optique), Paris, France

Filed Jan. 4, 1980, Ser. No. 109,462
Claims priority, application France, Jan. 30, 1979, 79 02273
Int. Cl.³ B01F *13/02*; B08B *11/00*
U.S. Cl. 366—101 3 Claims



1. A spectacle cleaning device comprising:
an open top container for containing a liquid detergent and spectacles,
a cover movable between a first position spaced from said open top of the container and a second position where it covers said open top,
an air diffusor mounted in the container below the level of the liquid for air agitating said liquid detergent,
an electrically energizable pressurized air generator for feeding pressurized air to said diffusor,
an electric voltage supply,
a push-button switch for controlling the energization of said generator by said supply, and
fixed abutment means for depressing said push-button switch when the cover is moved to its second position, so as to activate said air generator.

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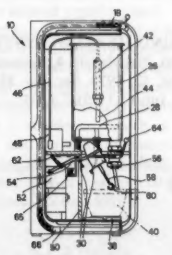
4,314,767

## DISPENSER OF HOT BEVERAGES PREPARED FROM WATER SOLUBLE EXTRACTS

Luigi Milani, via Spano 6/16, Turin, Italy

Filed Feb. 6, 1980, Ser. No. 119,133
Claims priority, application Italy, Feb. 6, 1979, 67252 A/79
Int. Cl.³ B01F *15/06*
U.S. Cl. 366—148 5 Claims



1. A dispenser for hot beverages prepared from water soluble extracts, said dispenser comprising a frame containing a water tank having a thermostatically controlled heater and a spigot for discharging heated water into a cup, a motor, a beating shaft coupled to and driven by said motor, an arm coupled to said beating shaft and pivotally coupled to the said frame, means for moving said arm downwardly until one extremity of said beating shaft is immersed in the heated water in the cup, said motor and said beating shaft being controlled by a normally open switch that is actuated by said arm at the end of its downward movement and, a return spring for maintaining said arm in a normally raised position to permit the removal of the cup from the dispenser.

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4,314,768

## SYRUP FEED SYSTEM FOR DRINK DISTRIBUTION APPARATUS OF THE AFTER-MIXING TYPE

Luigi Goglio, Via Frua 11, and Aldo Bassetti, Via Serbelloni 1, both of Milano, Italy

Filed May 7, 1979, Ser. No. 36,735
Claims priority, application Italy, May 5, 1978, 21739/78[U]; May 16, 1978, 21876/78[U]; Mar. 7, 1979, 20806 A/79
Int. Cl.³ B01F *15/02*
U.S. Cl. 366—156 33 Claims

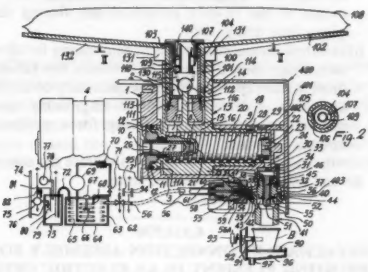

Fig. 2

1. A syrup feed system for drink distribution apparatus of the after-mixing type, comprising a mixing zone, means for dispensing syrup to said zone and means for simultaneously feeding water to said zone with which to dilute the syrup, the system comprising a flexible container containing syrup and provided with apierceable nozzle, support means for said container, means for receiving at least part of said nozzle, means for piercing said nozzle and means for conveying the syrup from the pierced nozzle to said syrup dispensing means.

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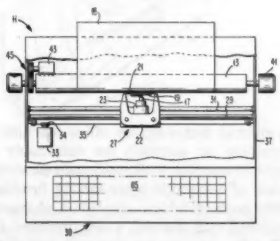
4,314,769

## ACOUSTICAL TONE GENERATOR

Edmund H. James, III, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 2, 1980, Ser. No. 155,289
Int. Cl.³ B41J *1/30, 29/46*
U.S. Cl. 400—144.2 4 Claims



1. In a typewriter/printer comprising a daisy wheel typefont driven by a variable reluctance selection stepper motor having stacked laminates, and control means for controlling the rotation of said stepper motor, the improvement comprising means for generating at least one acoustical tone of predetermined frequency for signaling at least one predetermined event, including:

detecting means within said control means for detecting the occurrence of said predetermined event and for identifying this event;

selecting means responsive to said detecting means for selecting said at least one of said acoustical tones;

generating means within said control means and responsive to said detecting and selecting means, for generating the selected tone, said generating means including:

(a) means for driving the stepper motor for rotating said stepper motor in one direction;

(b) delay means responsive to said means for driving, for maintaining said driving during a given time delay which at least proximates to one over twice the frequency of the selected acoustical tone, said delay means including a delay table storing digitally coded delay values;

(c) means responsive to said delay means for subsequently driving the stepper motor for rotating said stepper motor in the reverse direction and during the same given time delay; and

(d) control means connected to said means for driving, to said delay means and to said means for subsequently driving, for repetitively and sequentially controlling the operation of said means for driving, delay means and means for subsequently driving for a predetermined number of times;

whereby the daisy wheel is made to vibrate the surrounding air and generate said selected tone.

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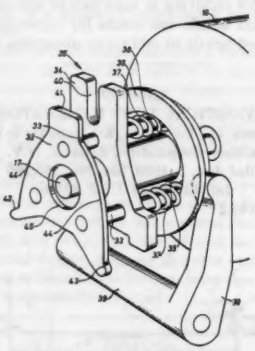
**4,314,770**

## DETACHABLE CONNECTION ASSEMBLY FOR A PRINTING ELEMENT IN AN ELECTRIC OFFICE MACHINE

**Kurt J. S. Harre, Karlshamn, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden**

**Filed Jan. 8, 1980, Ser. No. 110,533**
**Claims priority, application Sweden, Jan. 12, 1979, 7900299**
**Int. Cl.³ B41J *1/30***
**U.S. Cl. 400—175** **13 Claims**



1. In an electric motor-driven office machine the improvement comprising: an assembly for detachably connecting a print element to a motor shaft, said print element being of the general shape of a circular plate having flexible, radially extending arms each of which supports a character on the extreme peripheral end thereof, a dog member rigid with the motor shaft, a fixing means rotating with said shaft for supporting the print element, an actuation means for moving the fixing means along the motor shaft between a working position in which said fixing means is situated coaxially about said motor shaft and in which the print element is connected with and centered by the motor shaft and a loading position in which the fixing means is situated outside the end of said motor shaft, said print element being provided with attachment shoulders coacting with cooperating surfaces on said fixing means to detachably return said print element on said fixing means, the print element in the working position of the fixing means being clamped between axially opposite surfaces on the fixing means and the dog member respectively.

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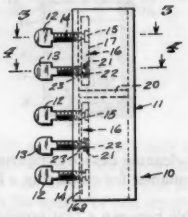
**4,314,771**

## EXTENSION CONNECTOR

**Hubert L. Lambert, Apt. A, 3512 Arcadia St., P.O. Box 413, Norfolk, Va. 23501**

**Filed Oct. 2, 1979, Ser. No. 81,112**
**Int. Cl.³ F16B *7/00***
**U.S. Cl. 403—305** **5 Claims**



1. An extension connector for coupling the ends of a first and a second shaft comprising an open ended sleeve for receiving the ends of said first and second shafts, at least one threaded opening in said sleeve, the central axis of said threaded opening being substantially normal to the central axis of said sleeve, a threaded actuator means rotatably mounted in said threaded opening for movement into and outwardly of said sleeve, said threaded actuator means having an inner end positioned within said sleeve, a pair of arcuate-shaped arms each having a first free end and a second end, mounting means for mounting said arcuate-shaped arms for pivotal movement on and connection to the inner end of said actuator means, said arcuate shaped arms extending from opposite sides of the inner end of said actuator means, and fulcrum means mounted within said sleeve and between said sleeve and mounting means to contact said arcuate shaped arms and pivot said arms about the inner end of said actuator means to move the first free ends thereof toward one another and inwardly of said sleeve as said actuator means is moved outwardly relative to said sleeve.

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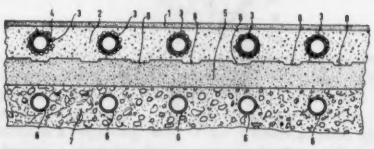
**4,314,772**

## GROUND HEATING SYSTEM

**Jakobus W. Lestraden, Nachtegall, 4, Sassenheim, Netherlands**

**Filed Dec. 13, 1979, Ser. No. 103,161**
**Int. Cl.³ E01C *3/06***
**U.S. Cl. 404—27** **6 Claims**



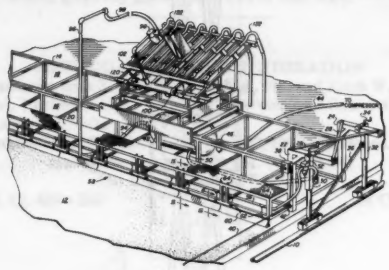
1. A ground heating system particularly for tracks such as runways, take-off and landing strips, parking lots and the like comprising a supply system for heat and a supply system for water to control the ground humidity wherein a porous stabilization layer is provided between the systems for the heat supply and the water supply to function as a water distributor and heat storage medium.

**4,314,773**

## HIGH DENSITY CONCRETE PLACER

**J. Dewayne Allen, Paragould, Ariz., assignor to Allen Engineering Corporation, Paragould, Ark.**

**Filed Dec. 21, 1979, Ser. No. 105,938**
**Int. Cl.³ E01C *19/38***
**U.S. Cl. 404—116** **53 Claims**



**36.** A high density concrete placer longitudinally translatable along a pair of parallel oriented support rails positioned adjacent to an area in which wet concrete has been poured comprising:

a. a bridge having first and second ends;

b. first and second roller assemblies coupled to the first and second ends of said bridge and contacting the support rails for supporting said bridge above the upper surface of the wet concrete and for enabling said bridge to be longitudinally translated along the support rails;

c. means coupled to the first and second ends of said bridge for controlling the elevation of said bridge with respect to the surface of wet concrete;

d. a table having front and rear sides and including:

i. a subframe having a front side pivotally coupled to the front side of said table;

ii. a plurality of immersible vibrator units coupled at spaced apart intervals to the rear side of said subframe and descending vertically downward therefrom for vibrating a segmental width of said wet concrete, wherein said segmental width is substantially less than the width of said concrete;

iii. means coupled to said table and to said subframe for vertically displacing the rear side of said subframe between a first and a second position wherein said vibrator units are elevated above the surface of the wet concrete in the first position and are immersed in the wet concrete in the second position; and

e. means coupled to said bridge and to said table for enabling said table to be incrementally laterally translated between the first and second ends of said bridge; whereby said table may be laterally translated an incremental distance along said bridge when said vertical displacing means is in the first position; a segmental width of said concrete is vibrated when said vertical displacement means is in the second position; and the entire width of said wet concrete may be vibrated after at least one lateral translation of said table with respect to said bridge.

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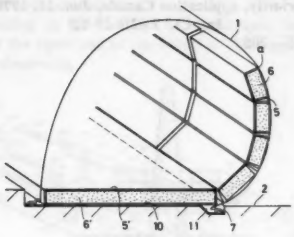
**4,314,774**

## PNEUMATICALLY INFLATABLE FLEXIBLE ENVELOPE TYPE DAM

**Yoshiomi Tsuji; Akio Matsuda; Tamaki Ikeda, and Kenji Mori, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Filed Oct. 29, 1979, Ser. No. 88,915**
**Claims priority, application Japan, Oct. 31, 1978, 53-134756**
**Int. Cl.³ E02B *7/02***
**U.S. Cl. 405—115** **13 Claims**

**1.** In an inflatable flexible envelope dam for damming a river, including a flexible envelope having an open end fixed to a river bed, said envelope being inflatable with a fluid to form an upstanding dam, and being deflatable so that said envelope falls down upon discharge of said fluid therefrom, whereby following said discharge, a residual amount of said fluid remains in



said envelope, the improvement comprising at least one attaching piece attached to said envelope, said attaching piece having a large specific gravity, the combined weight of said envelope, attaching piece, and residual amount of fluid being greater than the weight of said river displaced by said envelope, attaching piece, and fluid.

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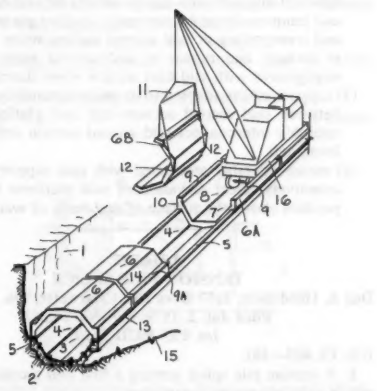
**4,314,775**

## METHOD OF SITE CASTING TUNNELS, CULVERTS, PRESSURE PIPES WITH MINIMUM FORMING

**Delp W. Johnson, 240 Oakview Dr., San Carlos, Calif. 94070**

**Filed Sep. 10, 1979, Ser. No. 74,084**
**Int. Cl.³ E02D *29/10***
**U.S. Cl. 405—155** **34 Claims**

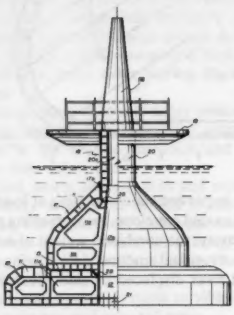


**1.** Methods of constructing a hollow structure in situ, comprising the steps of first casting a material to form a lower portion of the structure, said portion comprising a bottom and walls extending upward from said bottom, and; utilizing this first portion of the structure as a mold, casting therein a material to form a second portion, said second portion comprising a second bottom and walls extending upward from said second bottom; and lifting said second portion of the structure from said first portion; and inverting said second portion, and; lowering said second portion onto said first portion, position lower edges of walls of said second portion in position to support second portion of structure over said first portion of structure.

## 4,314,776
## OFFSHORE DRILLING AND PRODUCTION STRUCTURE

Harry E. Palmer; David G. C. Stenning, both of Calgary, Canada, and Ray K. Crockett, Perth, Australia, assignors to Dome Petroleum Limited, Calgary, Canada

Filed Jun. 21, 1979, Ser. No. 50,607
Claims priority, application Canada, Jun. 21, 1978, 305916
Int. Cl.³ E02D *23/02*
U.S. Cl. 405—205 14 Claims



1. A marine structure adapted to be located offshore in a body of water so as to provide elevated support for a working platform, said structure being of composite construction and comprising:

(1) a first selectively floatable and submergible base section, adapted to be installed on the floor of said body of water;

(2) a second selectively floatable and submergible, substantially conical section constructed and arranged to be locatable on and releasably engagable with said base section, to extend vertically therefrom and to be vertically separable therefrom such that the conical section can be buoyantly elevated and removed independently of said base section and temporarily or permanently, so as to permit removal and transporting of said second section when conditions so dictate, and return of said second section and re-engagement with said base section when desired;

(3) support means adapted to extend substantially vertically between said second section and said platform and to operably interconnect said second section and said platform; and

(4) means operably associated with said support means to selectively effect elevation of said platform to a stable position above the surface of said body of water.

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## 4,314,777
## TENSION PILE SPLICE

Don S. Henderson, 2357 Dora Dr., Clearwater, Fla. 33515

Filed Jul. 2, 1979, Ser. No. 54,263
Int. Cl.³ E02D *5/30*
U.S. Cl. 405—251 9 Claims

1. A tension pile splice joining a first and second concrete pile in axial alignment comprising:

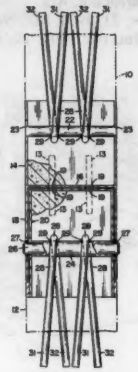
a bail sleeve closely fitted to the first pile and extending beyond the exterior of the end of the pile as a female socket;

a first shear pin means comprising at least one rod extending transversely through the first pile for securing the pile to said bail sleeve, said rod being secured to said bail sleeve;

anchor means secured to said shear pin means within the body of the pile for transfer of stress from said pin means to the interior of the first pile;

said second pile having an end section fitted within the female socket of said bail sleeve;

a second shear pin means being a composite comprising at least one pile sleeve extending transversely through the end section and a rod extending through said pipe sleeve and beyond to engage said bail sleeve, said rod being secured to said socket portion of said bail sleeve; and



anchor means secured to said pipe sleeve within the body of the pile to transfer stress from said pin composite to the interior of the second pile, whereby said piles are aligned for compression and anchored against separation under tension.

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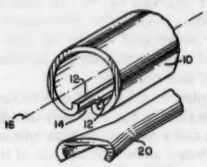
## 4,314,778
## FRICTION ROCK STABILIZER AND METHOD FOR INSERTING THEREOF IN AN EARTH STRUCTURE BORE

James F. Cantrel, Easton, Pa., assignor to Ingersoll-Rand Co., Woodcliff Lake, N.J.

Continuation of Ser. No. 95,375, Nov. 19, 1979. This application Feb. 12, 1981, Ser. No. 233,975
Int. Cl.³ E21D *21/00, 20/00*
U.S. Cl. 405—259 4 Claims



1. A friction rock stabilizer, for insertion in a bore formed in an earth structure for stabilizng the structure comprising:

a generally tubular body;

said body having an elongate central axis and wall means for frictionally engaging the surface of an earth structure bore;

said body further having a first, free, relaxed, transverse dimension predetermined to be larger than the transverse dimension of a bore into which it is to be inserted, and an axial length which is considerably greater than said transverse dimension; and

said body also having an axially-extended slit formed through said wall means thereof to permit said body to assume a second, constrained, transverse dimension which is smaller than both said first transverse dimension and the transverse dimension of a bore into which it is to be inserted; wherein

said wall means has overlapping, axially-extended and spaced-apart surfaces which: (1) define said slit therebetween, and (2) have axially extended, substantially parallel ribs formed adjacent to said surfaces for: (a) receiving contraction forces thereat, and (b) responsive to such

forces, for moving said ribs away from each other ; wherein

said ribs project substantially radially, relative to said elongate axis, and extend axially along substantially the full length of said body; and

at least one of said ribs projects inwardly, from said wall means, generally toward said axis of said body.

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**4,314,779**

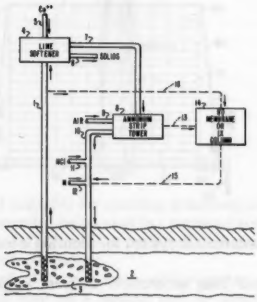
## METHOD OF AQUIFER RESTORATION

**Parameshwaran S. Sundar, Pittsburgh, Pa., and Erich W. Tiepel, Littleton, Colo., assignors to Wyoming Mineral Corp., Lakewood, Colo.**

**Continuation of Ser. No. 25,513, Mar. 30, 1979, abandoned. This application Nov. 3, 1980, Ser. No. 203,308**

**Int. Cl.³ E21B *43/27, 43/28***

**U.S. Cl. 405—263** **14 Claims**



**1.** A method of restoring a clay-containing aquifer which has been solution mined with a solution containing ammonium ions comprising:

(1) precipitating calcium carbonate from a solution pumped through said aquifer by the addition of calcium oxide, calcium hydroxide, or a mixture thereof in quantities sufficient to raise the pH to at least about 9.5;

(2) separating said precipitated calcium carbonate from said solution;

(3) removing ammonium ion from said solution;

(4) recycling said solution through said aquifer and repeating steps (1), (2), and (3) until the bicarbonate ion concentration in said solution has been reduced to an extent such that step (5) can be performed without plugging said aquifer;

(5) adding at least one soluble salt of calcium, magnesium, potassium, sodium, or mixtures thereof to said solution;

(6) recycling said solution through said aquifer and repeating steps (1), (2), (3), and (5) until the ammonium ion level is reduced to a desired level; and

(7) removing residual amounts of said salts introduced in step (5) from said aquifer.

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**4,314,780**

## TUBULAR KEY DUPLICATING MACHINE

**Aaron M. Fish, Hampstead, Canada; Joseph H. Schlessel, and Seymour B. Minski, both of Rocky Mount, N.C., assignors to Unican Security Systems Corporation, Rocky Mount, N.C.**

**Filed Feb. 11, 1980, Ser. No. 120,731**

**Int. Cl.³ B23C *1/16***

**U.S. Cl. 409—81** **3 Claims**

**1.** A key cutting machine for duplicating in the barrel of a tubular key blank the notches in the barrel of an original key, comprising

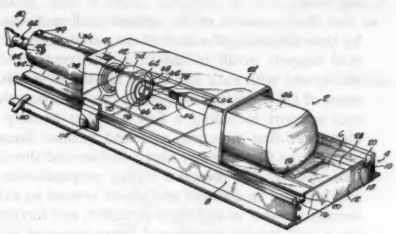
a chassis,

an end mill mounted on said chassis,

a plunger having front and rear ends respectively disposed towards and away from the end mill, and having on said front end a chuck for holding the keys blank,

plunger support means mounting said plunger on said chassis for endwise advancing and retracting reciprocating movement between advanced and retracted positions, respectively along an axis towards and away from the end mill and for rotation about said axis,

a key mounting on the rear end of the plunger for coaxially engaging the open end of the barrel of the original key for rotation therewith,



original key notch-engaging locator means on said plunger support means for entering original key notches in registry therewith, whereby angular orientation of the original key so as to register a notch with the locator means identically orients the key blank angularly with respect to the end mill, and

cooperative indexing means on said plunger and plunger support means for indexing the plunger to a predetermined angular position in the retracted position thereof.

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**4,314,781**

## COPYING MACHINE WITH AN OPTIC READING DEVICE

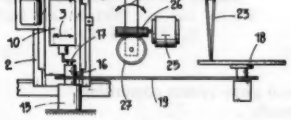
**Paul Willemin, Bassecourt, Switzerland, assignor to Willemin Machines S.A., Bassecourt, Switzerland**

**Filed Feb. 1, 1979, Ser. No. 8,240**

**Claims priority, application Switzerland, Feb. 6, 1978, 1269/78**

**Int. Cl.³ B23Q *35/10, 35/128, 35/40***

**U.S. Cl. 409—96** **3 Claims**



**1.** A copying machine including a frame, a movable workpiece support and a worktool, the worktool being mounted on a worktool support which is movable on the frame of the machine in at least three different directions relative to the workpiece support, the machine comprising:

at least three separate, continuous and planar line curves moving in synchronism with one another and the workpiece support;

at least three optical reading heads, each head cooperating with one of the curves simultaneously with the other heads and each head including means for displacing the head to follow the line of its associated curve;

first connection means between the worktool support and a first one of the reading heads for moving the worktool

support in a first direction of the three directions of movement in response to displacement of the first reading head;
second connection means between the worktool support and a second one of the reading heads for moving the worktool support in a second direction of the three directions of movement in response to displacement of the second reading head; and
third connection means between the worktool support and a third one of the reading heads for rotating the worktool support in a third direction of the three directions of movement in response to displacement of the third reading head;
so that displacements of the optical reading heads effected by their following the lines of the curves move the worktool support in all of the three different directions of movement with each line curve serving to control movement of the worktool support in one direction the worktool support including a first member linearly slidable along said first direction, a second member linearly slidable on the first member along said second direction, the first and second direction being perpendicular to one another, and an element articulated around an axis on the second member in said third direction, and further including a quill having an axis and being mounted on the element with the axis of the quill perpendicular to the axis on the second member so that the quill may rotate in said third direction around the axis of the second member and may linearly move in the first two directions.

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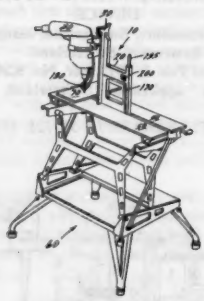
**4,314,782**

## TOOL GUIDE

**Gerald Beekenkamp, Mississanga, Canada, assignor to Black & Decker Inc., Newark, Del.**

**Filed Aug. 6, 1979, Ser. No. 63,845**
**Int. Cl.³ B23B *45/14, 49/00***
**U.S. Cl. 408—16** **9 Claims**



1. A tool guide system comprising:
a workbench;
a vise connected to said workbench;
said workbench having a worksurface lying in a first plane;
a tool guide including a substantially U-shaped body having first and second leg portions and a transverse portion connecting said two leg portions;
said transverse portion and said leg portions lying in a second plane;
said first leg portion having an outer longitudinal edge;
a longitudinal slideway of predetermined width connected along said outer longitudinal edge of said first leg portion;
said transverse portion extending beyond said slideway in the longitudinal direction;
said second leg portion and said transverse portion having a substantially uniform thickness less than the width of said slideway;
at least a part of said transverse portion being clamped in said vise below said first plane with said slideway disposed above and at a predetermined angle relative to said first plane;
said predetermined angle being in the range of from 0° through 90°; and
a tool holder slidably engaged with said slideway for securing a portable power tool to said tool guide.

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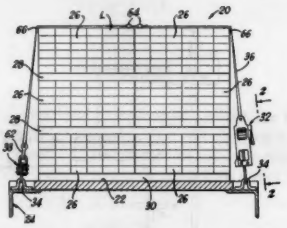
**4,314,783**

## QUICK RELEASE LOAD SECUREMENT DEVICE

**Lyle J. Parnell, Wheaton, and James L. Fabio, Crystal Lake, both of Ill., assignors to MacLean-Fogg Company, Mundelein, Ill.**

**Filed May 14, 1979, Ser. No. 38,643**
**Int. Cl.³ B60P *7/10*; B61D *3/16, 45/00***
**U.S. Cl. 410—34** **7 Claims**



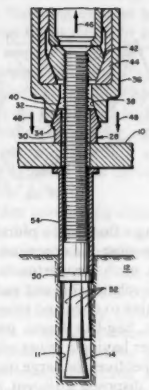
1. A load securement system for securing a load to a vehicle including:
an elongated load securement element engaged with the load;
anchor means on the vehicle;
a quick release load securement device having first and second attachment structures for connection of the device between the anchor means and the load securement element;
said load securement device being operable between set and released conditions wherein the spacing between said attachment structures is changed to apply tension to and release the tension in said elongated load securement element;
and the improvement in accordance with which said device is characterized by:
an elongated generally tubular housing;
a slide member slidable axially in said housing between the set and released positions;
said first and second attachment structures being connected respectively to said housing and said slide member and extending from opposite ends of said housing;
an opening extending transversely entirely through said slide member;
a lock pin supported in said slide member opening for transverse movement;
the wall of said tubular housing including a lock aperture receiving a first end of the lock pin when the slide member is in the set position;
spring means in said slide member opening for biasing said lock pin toward said lock aperture;
a release element supported on said housing and having a portion movable into said lock aperture for moving the lock pin out of the aperture; and
an elongated slot in the wall of said tubular housing opposite said lock aperture;
said lock pin being longer than the distance between said aperture and said slot, where a second end of said pin is received in said slot for guiding the sliding movement of said slide member in said housing when the lock pin is moved out of the aperture.

4,314,784

## SEAFLOOR ATTACHMENT BOLTS

Wayne R. Tausig, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 22, 1980, Ser. No. 152,456
Int. Cl.[3] F16B *13/06*
U.S. Cl. 411—57 2 Claims



1. A fastener assembly for securing structures to the seafloor, said fastener assembly being used in a prepared borehole in said seafloor and installable with a push-pull type riveting mechanism, and which comprises:

a. a unitary shaft of circular cross-section having a frusto-conically shaped head on a leading end for insertion into the borehole, said frusto-conically shaped head widening from a first diameter to a second diameter at the end of the shaft, said shaft including a non-threaded mandril section at the other end having annular grooves which form serrated edges around its perimeter; said shaft also including a waist section immediately adjacent said frusto-conically shaped head, said waist section being of said first diameter, said shaft further including a shank section between said mandril section and said waist section and having a diameter larger than said first diameter;

b. expansible means disposed around the waist section of said shaft above said frusto-conically shaped head for insertion into the borehole, said expansible means being in interference fit with said borehole; said expansible means including a cylindrical ring having a plurality of fingers in a cylindrical arrangement disposed with said fingers directed toward said frusto-conical head; the outer diameter of said cylindrical ring above said plurality of fingers being greater than the diameter of said shank section and the inner diameter of said cylindrical ring being smaller than the diameter of said shank section; the outer diameter of said expansible means in the area of said plurality of fingers being less than the outer diameter of said cylindrical ring;

c. a cylindrical reaction spacer disposed about said shaft between the bottom surface of said structure and said expansible means; the end of said cylindrical reaction spacer adjacent said expansible means preventing said expansible means from sliding past said cylindrical spacer on said shaft and operating to push said expansible means downward onto said frusto-conically shaped head by action of said riveting mechanism pulling on said unitary shaft;

d. a malleable collar adapted to be swaged onto said mandril section by said riveting mechanism; when the frusto-conically shaped head of said shaft and said expansible means are inserted into the borehole, and the mandril section of the shaft is disposed through an aperture in said structure and the malleable collar is disposed against the top surface of the structure, said shaft being operable to be pulled by said riveting mechanism without torquing to draw the frusto-conical head into said expansible means to cause said expansible means to expand so that an anchoring grip is obtained on the wall of the borehole, and said riveting mechanism simultaneously pushing on said malleable collar operating to swage said collar to the grooved mandril to maintain a non-slip anchoring grip.

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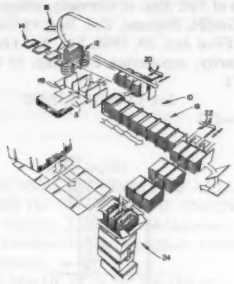
4,314,785

## STACKING AND PACKAGING APPARATUS

Paul J. LaFleur, Jr., Wilbraham, and Francis C. Crescenzo, Springfield, both of Mass., assignors to Package Machinery Company, East Longmeadow, Mass.

Filed Dec. 26, 1979, Ser. No. 107,175
Int. Cl.[3] B65G *57/30*
U.S. Cl. 414—46 23 Claims



23. In a packaging apparatus having a stacking mechanism for receiving an article at one level and moving the article to another level, said stacking mechanism including a pair of upwardly extending stacking spirals supported for rotation about transversely spaced apart axes, and first drive means for continuously rotating said stacking spirals in unison about said axes, the improvement comprising said first drive means including a gear train having eliptical gears for varying the speed of rotation of said continuously rotating stacking spirals during at least a portion of each rotation of said stacking spirals.

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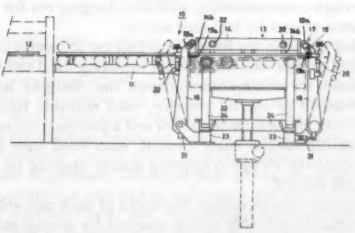
4,314,786

## METHOD AND APPARATUS FOR HANDLING CATHODE PLATE SUPPORT RODS

Leo Uusitalo, Tampere, and Pertti Tuominen, Kaaro, both of Finland, assignors to Outokumpo Oy, Finland

Filed Jan. 14, 1980, Ser. No. 111,641
Int. Cl.[3] B65G *57/18*
U.S. Cl. 414—57 15 Claims



1. A method for handling support rods which have been detached from cathode plates in an electrolytic refining plant comprising the steps of:

moving the support rods subsequent to their detachment from

the cathode plate in a longitudinal direction to a support rod grouping station;

arranging the support rods in the grouping station to form a group thereof having a predetermined size by moving the support rods one by one in a transverse direction a distance substantially equal to the breadth of a support rod with the exception of the last support rod in one group thereof and onto guide members on which the rods are supported so that the rods are in side by side relationship; and

packing each group of support rods, one above the other in layers, in a transporting and storage crate.

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**4,314,787**

## CHARGING CAR FOR COKE OVENS

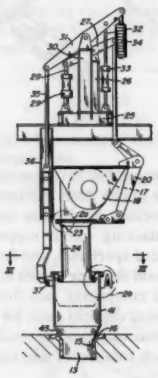
**Hans-Jürgen Kwasnik, Herne, and Hans-Günter Piduch, Bochum, both of Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. GmbH, Bochum, Fed. Rep. of Germany**

**Filed Jan. 29, 1980, Ser. No. 116,439**

**Claims priority, application Fed. Rep. of Germany, Jun. 2, 1979, 2922571**

**Int. Cl.³ C10B *31/02***

**U.S. Cl. 414—163** **5 Claims**



1. A coal-charging apparatus adapted to move along the top of a battery of coke ovens wherein the roof for each coking chamber includes spaced-apart charging holes with frames normally covered by lids that are removed to feed a charge of coal into the coking chamber, the coal-charging apparatus including a charging car with charging bins to discharge coal into an oven chamber,

a feed screw to convey coal from the bottom of each charging bin,

a trough communicating with the charging bin for conveyance of coal by said feed screw,

filling tubes carried by said charging car to receive coal from said trough, said filling tubes including fixed and movable tubes for communication with the charging hole after removal of the lid therefor, each movable tube having hooks on the outside thereof and a downwardly-extending seal lip on the inside thereof, each fixed tube having a peripheral trough containing sealant material on the outside thereof,

a support ring to engage the hooks of each movable tube,

a vertically-movable stirrup coupled for pivotal movement about a horizontal axis to each support ring to vertically position the movable tube of a filling tube,

a vertical guide on the outside wall of said trough, and

a linkage guided by said vertical guide for raising and lowering a stirrup.

**4,314,788**

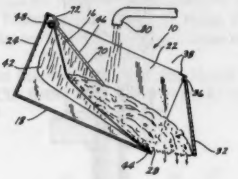
## CROP HANDLING APPARATUS

**Rodney B. Williams, Shandon Star Rte., Penman Springs Rd., Paso Robles, Calif. 93446, and Jerry A. Taylor, 600 W. "H" St., Dixon, Calif. 95620**

**Filed Jan. 24, 1980, Ser. No. 114,886**

**Int. Cl.³ B65G *65/23***

**U.S. Cl. 414—425** **12 Claims**



1. A container having a floor and a plurality of walls, including a divider wall providing the container with a pair of side-by-side compartments, each compartment having a discharge opening in side-by-side relationship and each having a movable wall selectively operative to open and close its discharge opening, a pair of flexible, bag-like liners, one disposed in each compartment, each liner having a lower edge thereof affixed to the floor along the respective discharge opening and having its opposite, upper edge disposed adjacent the top of the wall opposite said discharge opening, a pair of separate rollers journalled at and along the respective opposite walls and connected respectively to the liner upper edges, said rollers being coaxially disposed, and a pair of means connected respectively to the rollers for selectively rotating the rollers to wind and unwind the liners to facilitate loading and unloading of the compartments.

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**4,314,789**

## EQUIPMENT FOR LATERAL EXCAVATION

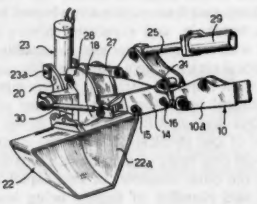
**Accossato Luigi, Castelrotto Di Guarene, Regione Piove, Cuneo, Italy**

**Filed Jun. 4, 1979, Ser. No. 44,845**

**Claims priority, application Italy, Jun. 20, 1978, 68440 A/78**

**Int. Cl.³ E02F *3/32***

**U.S. Cl. 414—694** **2 Claims**



1. Equipment for lateral digging, said equipment being applicable to hydraulic excavators provided with a manuever arm including a first arm element, hinged at its base on an anchor pivot carried by the excavator and parallel to the supporting surface thereof, and a second arm element hinged to the free end of the first arm element by an articulation pivot the axis of which is substantially parallel to the axis of the anchor pivot, the free end of said arm element being provided with means for supporting a bucket, characterized in that the means for supporting the bucket comprises:

a fastening element rigidly secured to the free end of the second arm element of the manuever arm

a first bearing structure hingedly coupled to the fastening element by a bearing pivot having an axis that is substantially parallel to the axis of the anchor pivot, a rigid one-piece second bearing structure supported by the first

bearing structure for rotation around a positioning pivot having an axis that is substantially perpendicular to the axis of said anchor pivot, the bottom end of the bucket being connected to said second bearing structure through a working pivot having an axis that is substantially parallel to the axis of the anchor point,

a rigid tie-rod laterally displaced relatively to the axis of said positioning pivot and connecting said second bearing structure to the fastening element by means of ball joint elements, whereby the angle of the bucket is adapted to be corrected with respect to the first and second arm elements in a plane parallel to the supporting surface of the excavator to thereby correct the bucket angle in a plane perpendicular to the supporting surface of the excavator, said tie-rod including means for varying its length, said last-mentioned means comprising a first hydraulic jack and an operator actuated jack drive means for adjusting the position of the jack,

the equipment further comprising crank assembly means for rotating the first bearing structure about the axis of the bearing pivot, said crank assembly means being formed by a connecting rod and a crank, and joining said structure with the fastening element, said connecting rod and the crank of said crank assembly means being respectively hinged to the first bearing structure and to the fastening element, and a second hydraulic jack having one end pivotally connected to the crank and the opposite end pivotally connected to the second element of the manuever arm, means for varying, in any predetermined position of the first bearing structure relative to the fastening element, the angular position of the tie-rod with respect to the first bearing structure, and means for rotating the bucket about the axis of the working pivot,

the positioning pivot connecting the first and second bearing structures lying substantially in the plane containing the two elements of the manuever arm,

the plane passing through the axis of the positioning pivot and containing the point connecting the tie-rod with the second bearing structure being substantially perpendicular to the central plane of the bucket, and

the distance of the axis of the bearing pivot from the connection between the tie-rod and the fastening element being substantially one third of the distance of the axis of the positioning pivot from the connection of the tie-rod with the second structure.

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**4,314,790**

## METHOD OF AND DEVICE FOR SHIPPING HOT METAL GOODS

**Paul Metz, Luxembourg, Luxembourg, assignor to Arbed S.A., Luxembourg, Luxembourg**

**Filed Aug. 22, 1979, Ser. No. 68,665**

**Claims priority, application Luxembourg, Aug. 22, 1978, 80145**

**Int. Cl.³ B60P** *3/00*

**U.S. Cl. 414—786** **15 Claims**

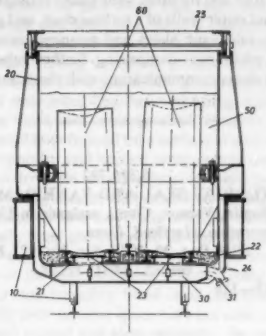
1. A method of shipping hot metal goods, comprising the steps of:

(a) introducing a granular insulating material into an open-top wheeled container;

(b) fluidizing said material in said container with a pressurized gas introduced into said container at the bottom thereof;

(c) lowering the hot metal goods into said container during the fluidization of said material to enable said metal goods to rest upon the bottom of said container;

(d) terminating the fluidization of said material in said container upon introduction of said metal goods into said container in step (c), thereby permitting said material to pack around and envelop the metal goods in said container;




(e) covering said container; and

(f) displacing said container on its wheels.

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**4,314,791**

## VARIABLE STATOR CASCADES FOR AXIAL-FLOW TURBINES OF GAS TURBINE ENGINES

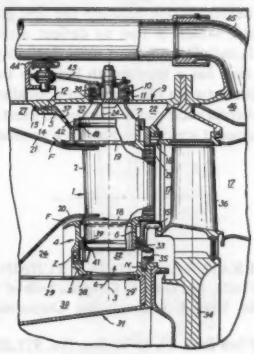
**Wolfgang Weiler, Dachau, Fed. Rep. of Germany, assignor to Motoren- und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany**

**Filed Mar. 6, 1979, Ser. No. 18,221**

**Claims priority, application Fed. Rep. of Germany, Mar. 9, 1978, 2810240**

**Int. Cl.³ F01D** *7/00, 25/12*

**U.S. Cl. 415—115** **9 Claims**



1. A variable stator cascade apparatus for axial-flow turbines, particularly for high-pressure turbines of gas turbine engines comprising: nozzle vanes each pivotally arranged about an axis of rotation and having cooling means when in operation; the variable stator cascade being formed of circumferentially interlocking inner and outer ring segments providing circumferential sealing action so that at least one turbine nozzle vane is pivotally arranged and disconnectable connected by respective root and tip side pivot pins in association with each respective inner and outer ring segment; a continuous inner stator ring centrally located at inner ring segments of the stator cascade by way of attachment means comprising teeth and a slot-and-key arrangement so that each outer ring segment arranged at the turbine casing cooperates with said attachment means to radially guide said at least one turbine nozzle vane and associated inner ring segment; said nozzle

vanes secured in radial, axial and circumferential position by said outer ring segment; said nozzle vanes having at their respective root and tip sides, vane plates arranged in the area of the inner and outer walls of a turbine duct, said pivot pins being attached to said vane plates and arranged outside the turbine duct, said pivot pins comprising further tubular cylindrical cooling air ducts communicating with the interior of the vane.

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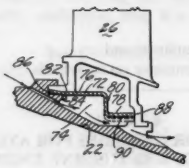
**4,314,792**

## TURBINE SEAL AND VANE DAMPER

**Gary F. Chaplin, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.**

**Filed Dec. 20, 1978, Ser. No. 971,287**
**Int. Cl.³ F01D *11/08***
**U.S. Cl. 415—116** **15 Claims**



**1.** In a gas turbine engine of the type having a stator assembly including an engine case and a plurality of vanes extending inwardly therefrom, the improvement which comprises:

a ring extending circumferentially about the interior of the case to form a chamber therebetween and having,

a first end which engages the engine case,

a second end which engages at least one of said vanes, and

a radial center section between the first end and the second end, which is free to deflect axially and which extends radially to impart axial flexibility,

wherein the ring has a free length between the ends and an installed length between the ends that is smaller than the free length and wherein each end is adapted to exert a sealing force against the adjacent stator assembly in a generally axial direction.

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**4,314,793**

## TEMPERATURE ACTUATED TURBINE SEAL

**Francis L. DeTolla, and Gary F. Chaplin, both of Vernon, Conn., assignors to United Technologies Corporation, Hartford, Conn.**

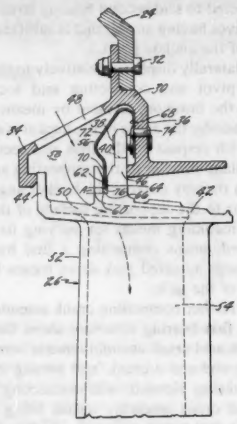
**Filed Dec. 20, 1978, Ser. No. 971,290**
**Int. Cl.³ F01D *11/00, 9/04***
**U.S. Cl. 415—135** **11 Claims**

**1.** In a gas turbine engine of the type having a nonrotating structure inwardly of an annular flow path for working medium gases and a nonrotating structure outwardly of the engine flow path, the improvement which comprises:

a plurality of vanes extending inwardly across the flow path from the outward structure; and

a diaphragm which extends from the inward structure into proximity with the vanes, and which is spaced radially from said plurality of vanes leaving a gap therebetween, and

wherein each of said vanes has a coefficient of thermal expansion causing the vanes to grow inwardly in response to engine operating temperatures and said diaphragm has a coefficient of thermal expansion causing the diaphragm to grow outwardly in response to engine operating temperatures such that each of said vanes and said diaphragm are adapted to grow radially a distance larger than the gap



to engage in intimate contact in response to engine operating temperatures.

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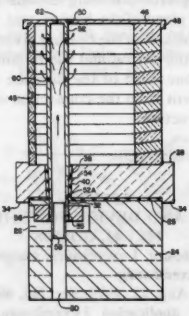
**4,314,794**

## TRANSPIRATION COOLED BLADE FOR A GAS TURBINE ENGINE

**Abe N. Holden, deceased, late of Broomall, Pa., and by Joyce A. Holden, executrix, Half Moon Bay, Calif., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Oct. 25, 1979, Ser. No. 88,245**
**Int. Cl.³ F01D *5/18***
**U.S. Cl. 416—97 A** **10 Claims**



**1.** A blade for a gas turbine engine comprising: a plurality of hollow ceramic washers having an airfoil cross-section and radially stacked upon each other to form the airfoil portion of the blade; a metal cap covering the radially outermost washer and defining the blade tip; a metal blade root defining a shank portion and rotor disc engaging projections; a ceramic platform member interposed between the radially innermost washer and the blade root; a perforated metal tie tube secured to said cap and extending generally radially therefrom through the airfoil portion and radially aligned apertures in the platform and shank portion is terminate within a cavity in said root portion to provide coolant flow communication from within said root to within said air-foil portion; means within said cavity for tensioning said tie tube; and wherein said ceramic washers include coolant flow channels extending therethrough for effusion of the coolant from within the airfoil portion to the

external side thereof for transpiration cooling of said airfoil portion of the blade.

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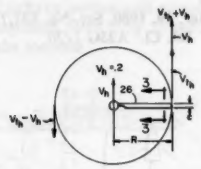
4,314,795

## ADVANCED AIRFOILS FOR HELICOPTER ROTOR APPLICATION

Leone U. Dadone, West Chester, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 28, 1979, Ser. No. 79,706
Int. Cl.[3] B64C 27/46
U.S. Cl. 416—223 R 24 Claims



1. A rotor blade for a rotorcraft which comprises: a spanwise member, said spanwise member having an airfoil shaped cross section having a curved leading edge and a sharp trailing edge and having a pitching element coefficient at zero lift within the range of ±0.01, a maximum coefficient of lift greater than 1.2, and a drag divergence mach number at zero lift greater than 0.78, wherein the values of the coefficient of lift are at mach numbers of approximately 0.4 and the pitching moment coefficient at zero lift is at a low speed.

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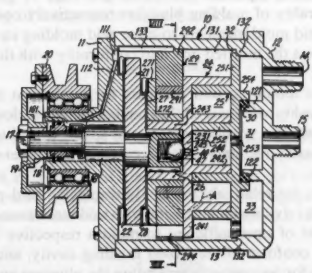
4,314,796

## SCROLL-TYPE COMPRESSOR WITH THRUST BEARING LUBRICATING AND BYPASS MEANS

Kiyoshi Terauchi, Isesaki, Japan, assignor to Sankyo Electric Company Limited, Isesaki, Japan

Filed Aug. 29, 1979, Ser. No. 70,870
Claims priority, application Japan, Sep. 4, 1978, 53/108411; Sep. 4, 1978, 53/108413; Sep. 4, 1978, 53/108415; Sep. 4, 1978, 53/108416; Oct. 30, 1978, 53/134172; Oct. 30, 1978, 53/134174
Int. Cl.[3] F04C 18/02, 29/00, 29/02; F04B 49/02
U.S. Cl. 417—294 13 Claims



1. In a scroll-type fluid compressor unit including a compressor housing having a front end plate and a rear end plate, a fixed scroll member fixedly disposed within said compressor housing and having first end plate means to which first wrap means are affixed, an orbiting scroll member orbitally mounted within said compressor housing and having second end plate means to which second wrap means are affixed, said first and second wrap means interfitting at a predetermined angular relationship to make a plurality of line contacts to define at least one sealed off fluid pocket, a drive mechanism connected to said orbiting scroll member for transmitting the orbital motion to said orbiting scroll member, means for preventing rotation of said orbiting scroll member, and means for supporting a thrust force, the improvement which comprises: said drive mechanism including a drive shaft supported by first radial bearing means in said front end plate and extending outwardly through said front end plate, a disk rotor member mounted on an inner end of said drive shaft and supported by first thrust needle bearing means on an inner surface of said front end plate, and a drive pin axially projecting from a rear surface of said disk rotor member and being radially offset from said drive shaft, said orbiting scroll member being provided with an axial boss formed on a surface of said second end plate member opposite said second wrap means and rotatably mounted on said drive pin which is fitted into said boss through second radial bearing means, said axial boss having a projecting end proximate to said drive pin, a radial flange member extending radially from and disposed on said projecting end of said axial boss and being supported by second thrust needle bearing means on the rear surface of said disk rotor member, a hollow member non-rotatably fitted onto said axial boss and extending axially over an axial space between said radial flange member and said second end plate, whereby the axial force is supported on the inner surface of said front end plate through said hollow member, said radial flange member, said second thrust needle bearing means, said disk rotor member and said first thrust needle bearing means so that deflection of said drive shaft may be prevented, and said rotation preventing means are disposed around said axial boss.

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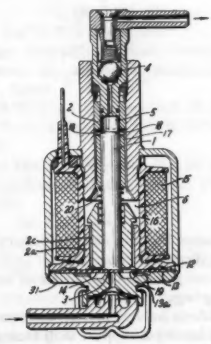
4,314,797

## METERING PISTON PUMP

Reinhard Gerwin, Stuttgart, Fed. Rep. of Germany, assignor to J. Eberspacher, Esslingen am Neckar, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 876,505, Feb. 9, 1978, abandoned, which is a continuation of Ser. No. 739,050, Nov. 5, 1976, abandoned, which is a continuation of Ser. No. 547,498, Feb. 6, 1975, abandoned. This application Mar. 28, 1979, Ser. No. 24,666
Int. Cl.[3] F04B 7/04, 17/04, 21/02
U.S. Cl. 417—491 3 Claims



1. A metering pump particularly suitable for feeding fuel to a furnace comprising: means defining a pumping chamber; piston means movable through an operating stroke within said pumping chamber in a first direction and in a second direction opposite thereto; said pumping chamber being configured to define a fluid inlet chamber including fluid inlet means on one side of said piston means and a fluid outlet chamber including fluid outlet means on the opposite side of said piston means; first valve means in said fluid inlet means, said first valve means comprising a resilient flap member formed on a fixedly clamped disc of elastic material; second valve means in said fluid outlet means; said first valve means and said second valve means being arranged to simultaneously open when said piston means is moved in said first direction and to simultaneously

close when said piston means is moved in said second direction; hydraulic accumulator means; and means establishing flow communication between said accumulator means and said pumping chamber; said pump being arranged such that when said piston means is moved in said first direction, fluid is drawn into said inlet chamber from a source thereof with fluid being simultaneously pumped from said outlet chamber, and such that when said piston means is moved in said second direction, fluid is pumped under pressure into said accumulator means from said inlet chamber during an initial portion of the movement of said piston means in said second direction; said communication means being arranged to establish flow communication with said outlet chamber during a latter portion of the movement of said piston means in said second direction to enable fluid in said accumulator means to flow into said outlet chamber; and a body portion comprising said means defining said pumping chamber with a cavity defined in said body portion adapted to constitute said hydraulic accumulator, said cavity being defined in part by said clamped disc such that when said piston means moves in said second direction, the clamped disc is deformed and fluid is forced into said cavity from said inlet chamber.

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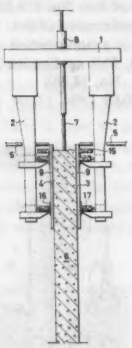
**4,314,798**

## APPARATUS FOR ARRANGEMENT OF COMBINED STATIONARY AND SLIP FORM CASTING OF CONCRETE

**John P. Pettersson, Pl. 1130, 760 15 Gräddö, Sweden**

**Filed Mar. 17, 1980, Ser. No. 130,610**
**Claims priority, application Sweden, Mar. 16, 1979, 7902383**
**Int. Cl.³ B28B *17/00***
**U.S. Cl. 425—63** **5 Claims**



1. An apparatus for combined stationary form and slipform casting in one direction comprising:

A. A slipform yoke having a pair of substantially parallel depending legs;

B. A pair of form halves carried between the yoke legs, each form half having a support wall facing the other support wall, a form panel on the facing sides of each support wall between which the concrete may be poured, and the form halves including means which are upwardly expansible in said one direction to substantially increase the area of the support walls by a factor of about two, each support wall having an upper and lower portion movable with respect to each other and each formed from a plurality of generally parallel boards extending vertically, the boards of the two portions being interdigitated to permit said upward expansion

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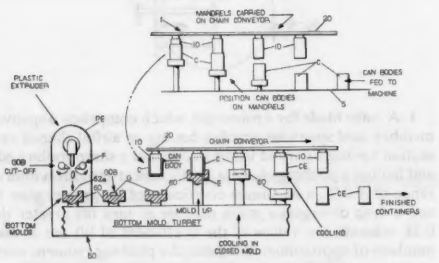
**4,314,799**

## COMPRESSION MOLDING MACHINE FOR ORGANIC THERMOPLASTIC MATERIALS

**Stephen W. Amberg, Toledo, Ohio, and Ralph G. Amberg, Youngs Mountain South, N.C., assignors to Owens-Illinois, Inc., Toledo, Ohio**

**Filed Mar. 19, 1980, Ser. No. 131,713**
**Int. Cl.³ A23G *1/20***
**U.S. Cl. 425—296** **12 Claims**




1. In an apparatus for press forming organic thermoplastic material into molded parts having an extruder continuously producing a rodlike formation of hot moldable organic thermoplastic material and gob feeding means periodically engaging said formation to sever same into discrete gobs of substantially the same quantity of material, the improvement comprising:

(1) a plurality of mold members having exposed molding cavities;

(2) means for moving said mold members in timed relationship to said feeding means along a closed loop path intersecting the gravity path of said severed gobs, whereby each gob is deposited in a molding cavity;

(3) a plurality of molding plungers respectively cooperable with said mold members to close said molding cavity and compress the inserted gob into conformity with the closed cavity;

(4) means mounting said plungers for movement in timed relationship with said mold members along a closed loop path having a portion parallel and adjacent to the path of said mold members after receiving the severed gobs therein;

(5) means for relatively vertically displacing said plungers respectively into engagement with said mold members for a period of time sufficient to mold a respective inserted gob to conform to the closed molding cavity, and

(6) means for successively separating the plungers and molding members for respectively removing the molded plastic articles.

4,314,800

## METHOD FOR TREATING PELTS AND LEATHER

Rolf Monsheimer; Ernst Pfleiderer, both of Darmstadt; Werner Siol, Pfungstadt; Hanns Boessler, Darmstadt, and Hans Trabitzsch, Seeheim-Jugenheim, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

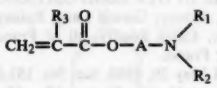
Filed Apr. 8, 1981, Ser. No. 252,164

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1980, 3013912

Int. Cl.³ C14C *11/00*

U.S. Cl. 8—94.1 R 20 Claims

1. A method for treating pelts or leather in the beamhouse, for tanning, or as an after-treatment, which method comprises contacting said pelts or leather with an aqueous dispersion of a copolymer comprising from 5 to 25 percent by weight of a compound of the formula



wherein $R_1$ and $R_2$ are each alkyl having 1 to 4 carbon atoms, $R_3$ is hydrogen or methyl, and A is alkyl having up to 10 carbon atoms or is an unsubstituted or alkyl-substituted carbocyclic or N- or O-heterocyclic group having up to 10 carbon atoms; from 67 to 92 percent by weight of an acrylate or methacrylate ester of an alkanol having 1 to 14 carbon atoms; and from 1 to 8 percent by weight of acrylic acid or methacrylic acid, whereby portions of said polymer are deposited in the grain layer without formation of a superficial film.

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4,314,801

## SOAKING METHOD

Rolf Monsheimer, and Ernst Pfleiderer, both of Darmstadt, Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Oct. 27, 1980, Ser. No. 201,049

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1979, 2944462

Int. Cl.³ C14C *1/04*

U.S. Cl. 8—94.14 11 Claims

1. A method for soaking dried or salted fur pelts which consists essentially of soaking said pelts in an aqueous bath containing at least one compound selected from the group consisting of compounds of the formula

and acid addition salts of such compounds, wherein R taken alone is —H, —$NH_2$, —$CH_3$, or —NHCN, X taken alone is =O, =S, or =NH, and R and X taken together form a five- or six-membered heterocyclic ring having conjugated double bonds therein and containing only nitrogen as a hetero atom.

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4,314,802

## PROCESS FOR PRODUCING LEATHER

William C. Beier, Short Hills, N.J., and James J. Hodder, Doylestown, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Aug. 24, 1979, Ser. No. 69,470

Int. Cl.³ C14C *3/06, 1/08, 3/22, 3/28*

U.S. Cl. 8—94.26 12 Claims

1. A multiple-stage tanning process for producing an improved, tanned, heavy leather, comprising the steps, carried out in a series of aqueous tanning baths, of:

(1) providing a piece of wet leather stock selected from the group consisting of pickled leather stock, bated leather stock, and limed leather stock;

(2) adjusting the pH of the leather stock provided in step (1) to obtain a pH of the leather stock in the range of 4.5–5.5;

(3) treating the leather stock from step (2), while establishing and maintaining the pH thereof at 4.5–5.5, with 1–50% by weight, based on the initial wet weight of the leather stock, of a first tanning composition comprising an aqueous dispersion or solution of a polymer polymerized from a monomer mixture comprising at least one member selected from a group consisting of acrylic acid, methacrylic acid, mixtures of acrylic acid and methacrylic acid, and mixtures of a major proportion of at least one member selected from the group consisting of acrylic acid and methacrylic acid with a minor proportion of at least one member selected from the group consisting of alkyl esters of acrylic acid, alkyl esters of methacrylic acid, and partially sulfated unsaturated drying oils, until the leather stock is penetrated therewith;

(4) adjusting the pH of the leather stock from step (3) to 1.5–3.3 to exhaust the first tanning composition and to obtain an optimal pH for the subsequent second tanning treatment;

(5) treating the leather stock of step (4), while establishing and maintaining the pH thereof at 1–3.3, with 5.5–20% by weight, based on the initial wet weight of the leather stock, of a second tanning composition comprising a zirconium tanning compound having 0–45% basicity calculated on the Schorlemmer scale, the amount of the zirconium tanning compound being sufficient to provide an amount of zirconium calculated as the oxide of about 1.8–6.6% by weight, based on the initial wet weight of the leather stock, until the leather stock is tanned to the desired extent;

(6) neutralizing the tanned leather stock from step (5) to a pH of 3.5–5 by the addition to the tanning bath of an aqueous solution of a weak base; and

(7) washing the tanned leather stock from step (6) with water, optionally further treating the washed tanned leather stock with conventional adjuvants, and drying the tanned leather stock in conventional operations.

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4,314,803

## TANNING METHOD

Tohru Okabe, Hyogo; Shigeaki Mizutani, Himeji, and Saburo Hayashi, Kakogawa, all of Japan, assignors to Seitetsu Kagaku Co., Ltd., Japan

PCT No. PCT/JP79/00041, § 371 Date Oct. 23, 1979, § 102(e) Date Oct. 17, 1979, PCT Pub. No. WO79/00712, PCT Pub. Date Oct. 4, 1979

PCT Filed Feb. 21, 1979, Ser. No. 187,857

Claims priority, application Japan, Feb. 23, 1978, 53-20517; Jan. 22, 1979, 54-6763

Int. Cl.³ C14C *3/06*

U.S. Cl. 8—94.26 13 Claims

1. A chrome-tanning method comprising subjecting a hide which has completed beamhouse work to a pickling treatment in the presence of hexamethylenetetramine wherein the pickling composition consists essentially of acid, neutral salt and water; and then subjecting the hide to a chrome-tanning.

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4,314,804

## PROCESS FOR WASHING DYED OR PRINTED TEXTILE MATERIAL

Peter Fennekels, and Ernst Waltmann, both of Krefeld, Fed. Rep. of Germany, assignors to Girmes-Werke AG, Grefrath, Fed. Rep. of Germany

Filed Jan. 25, 1980, Ser. No. 115,415

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1979, 2903134

Int. Cl.³ B08B *7/04;* C11D *9/42, 1/02, 1/86*

U.S. Cl. 8—137 6 Claims

1. A process for washing dyed or printed textile pile fabric to remove unwanted residual substances from the dying or printed process of the fabric, comprising the steps of:

applying to the side of the fabric opposite the pile a foam which is produced from a liquid consisting essentially of at least one surface active agent and polyvinylpyrrolidone, said foam having a temperature of between about 60° C. and 95° C. during application to said fabric; and

removing the foam by applying suction to the pile side of fabric wherein said process is carried out in a continuous manner.

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**4,314,805**

## LAUNDRY PROCESS AND METHOD FOR TREATING TEXTILES

**Eugene A. McKnight, 7727 Meadow Rd., #229, Dallas, Tex. 75230**

**Continuation of Ser. No. 88,873, Oct. 29, 1979, abandoned, which is a continuation of Ser. No. 871,678, Feb. 16, 1978, abandoned, which is a continuation-in-part of Ser. No. 828,757, Aug. 29, 1977, abandoned. This application Dec. 11, 1980, Ser. No. 215,454**

**Int. Cl.³ B08B *3/00***

**U.S. Cl. 8—137** **5 Claims**

1. A method for laundering a textile to give it improved soil resistance comprising contacting said textile with a pre-solubilized aqueous solution of a polyvinyl alcohol in the last bath of the laundry process and thereafter drying said textile.

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**4,314,806**

## TEXTILE FINISH AND PROCESSES FOR ITS PREPARATION AND USE

**Harro Petersen, Frankenthal, Fed. Rep. of Germany; Panemangalore S. Pai, and Manfred Reichert, both of Charlotte, N.C., assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

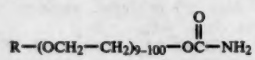
**Filed Sep. 8, 1980, Ser. No. 184,814**

**The portion of the term of this patent subsequent to Jun. 10, 1997, has been disclaimed.**

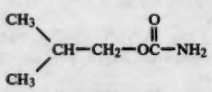
**Int. Cl.³ D06M *15/54***

**U.S. Cl. 8—187** **3 Claims**

1. A finish for textiles containing cellulose, which comprises an aqueous solution of from 30 to 70 percent strength by weight of a mixture of the conventionally methylolated derivatives of carbamates I and II



I



II

where R is hydrogen or alkyl of 1 to 4 carbon atoms in the weight ratio I:II of from 1:1 to 1:20.

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**4,314,807**

## HAIR DYE COMPOSITION CONTAINING A HAIR DYE FORMULATION PACKAGED IN TWO PARTS

**Jean-Francois Grollier, Paris; Christian Monnais, Neuilly-sur-Seine, and Lyonnel Peritz, Boulogne-sur-Sein, all of France, assignors to L'Oreal, Paris, France**

**Filed Nov. 15, 1976, Ser. No. 742,117**

**Claims priority, application Luxembourg, Nov. 13, 1975, 73793; Nov. 13, 1975, 73794; Nov. 13, 1975, 73795**

**Int. Cl.³ A61K *7/13***

**U.S. Cl. 8—406** **1 Claim**

1. A composition for dyeing hair comprising a combination of two formulations, one to be applied to the hair immediately after the other, the first to be applied formulation being an effective amount of a hair dye formulation comprising a mixture of an oxidation hair dye composition containing at least one hair dye or dye precursor and a hair dye carrier, an oxidizing agent and at least one cationic polymer and the last to be applied formulation being an effective amount of a shampoo formulation comprising an anionic detergent, said hair dye formulation being packaged into two parts, one part comprising said hair dye carrier and said hair dye or dye precursor, and said other part comprising said cationic polymer alone or in solution in a solvent, said two parts being admixed at the time of use.

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**4,314,808**

## DYE POLYMERS, THEIR PREPARATION AND THEIR USE IN DYE COMPOSITIONS

**Bernard Jacquet, Antony; Gerard Lang, Epinay-sur-Seine, and Serge Forestier, Claye Souilly, all of France, assignors to L'Oreal, Paris, France**

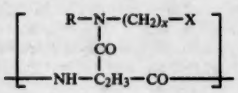
**Filed May 20, 1980, Ser. No. 151,620**

**Claims priority, application France, May 25, 1979, 79 13347**

**Int. Cl.³ C09B *1/28, 69/10***

**U.S. Cl. 8—405** **21 Claims**

1. A dye polymer, or a mixture thereof, comprising units of the formula



defined as A units wherein

R represents hydrogen or alkyl,

x is a whole number equal at least to 2, and

X represents the residue of a molecule of a dye or a dye precursor.

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**4,314,809**

## NOVEL COUPLER COMPONENTS FOR OXIDATION HAIR DYES, THE MANUFACTURE THEREOF, AND HAIR COLORANTS

**David Rose, Hilden; Peter Busch, Erkrath-Unterbach; Edgar Lieske, Düsseldorf, and Günther Konrad, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany**

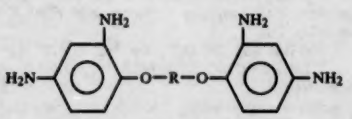
**Filed Nov. 14, 1979, Ser. No. 94,276**

**Claims priority, application Fed. Rep. of Germany, Dec. 2, 1978, 2852156; Aug. 10, 1979, 2932460**

**Int. Cl.³ A61K *7/13*; D06P *1/32, 3/08***

**U.S. Cl. 8—406** **6 Claims**

1. An aqueous preparation of the developer-coupler type for the dyeing of hair, consisting essentially of (A), as coupler, a bis-(2,4-diaminophenoxy)-alkane of formula



wherein R is a linear or branched alkylene radical of from 1 to 12 carbon atoms, or an inorganic or organic acid salt thereof, and (B), as developer, one of the conventional developer substances.

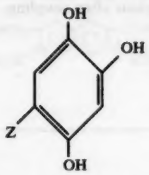
4,314,810

## COMPOSITIONS SUITABLE FOR USE IN DYEING HAIR OBTAINED FROM THE REACTION OF A POLYHYDROXYBENZENE AND AN OXIDATIVE DYESTUFF PRECURSOR OF THE PARA TYPE

Chantal Fourcadier, and Jean F. Grollier, both of Paris, France, assignors to L'Oreal, Paris, France

Filed Jul. 26, 1979, Ser. No. 61,035
Claims priority, application France, Jul. 27, 1978, 78 22296
Int. Cl.³ A61K 7/13
U.S. Cl. 8—410 27 Claims

1. Process for the preparation of a composition suitable for use in dyeing human hair, which comprises the following steps in sequence: (1) reacting in an anaerobic medium (a) at least one polyhydroxybenzene of the formula:




in which Z denotes an alkoxy or alkyl radical containing 1 to 4 carbon atoms or a hydrogen atom, and (b) at least one oxidative dyestuff precursor of the para type in a first solvent, said first solvent being dioxane, tert.-butyl alcohol, benzyl alcohol, cyclohexanol or a mixture or aqueous solution thereof, or solvents which do not give eutectics with water; (2) freezing the reaction to obtain a reaction mixture containing said at least one polyhydroxybenzene, said at least one oxidative dyestuff precursor of the para type and at least one leuco derivative; (3) lyophilising the reaction mixture thereby removing the first solvent; and (4) dissolving the lyophilised product of step (3) in a second solvent, said second solvent being ethyl, butyl, isopropyl, benzyl or phenylethyl alcohol, ethylene glycol, propylene glycol, butylglycol or a mono-, di- or tri-ethylene glycol monoalkyl ether, or an aqueous mixture thereof.

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4,314,811

## TWO-PHASE PRINTING PROCESS FOR PREPARING CONVERSION ARTICLES AND DISCHARGE RESIST PRINTS

Erich Feess, Hofheim am Taunus, and Friedrich Reinhardt, Bad Soden am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 1, 1980, Ser. No. 165,028
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1979, 2945095
Int. Cl.³ D06P 5/15
U.S. Cl. 8—457 7 Claims

1. A two-phase process for preparing conversion articles with reactive and vat dyestuffs or discharge resist prints with reactive dyestuffs or a mixture of reactive and vat dyestuffs on cellulosic materials, which comprises

(a) printing or padding the material with a weakly acidic printing paste or padding liquor containing the reaction dyestuff or the mixture of reactive and vat dyestuffs,

(b) overprinting the material with a neutral printing paste containing formamidine sulfinic acid,

(c) drying the material,

(d) contacting the material with an aqueous strongly alkaline liquor,

(e) steaming the material and

(f) finishing the article.

4,314,812

## TWO-PHASE PRINTING PROCESS FOR PREPARING CONVERSION ARTICLES AND DISCHARGE RESIST PRINTS

Erich Feess, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 1, 1980, Ser. No. 165,029
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1979, 2926651
Int. Cl.³ D06P 5/15
U.S. Cl. 8—457 10 Claims

1. A two-phase process for preparing conversion articles with reactive and vat dyestuffs or discharge resist prints with reactive dyestuffs or a mixture of reactive and vat dyestuffs on cellulosic materials, which comprises

(a) printing or padding the material with a weakly acidic printing paste or padding liquor the pH of which is sufficiently low as to ensure that the reactive dyestuff is not fixed on the cellulose and which contains the reactive dyestuff or the mixture of reactive and vat dyestuffs,

(b) overprinting the material with a neutral printing paste containing a stable reducing agent of an alkali metal or an alkaline earth metal salt of a sulfinic acid,

(c) drying the material,

(d) contacting the material with an aqueous strongly alkaline liquor,

(e) steaming the material and

(f) finishing the article.

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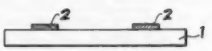
4,314,813

## FLOCK TRANSFER SHEET AND FLOCK TRANSFER PRINTING PROCESS

Yasuzi Masaki, No. 11-3, Shin-Ohashi 1-chome, Koto-ku, Tokyo, Japan

Filed Sep. 29, 1980, Ser. No. 191,726
Claims priority, application Japan, Nov. 16, 1979, 54-148477
Int. Cl.³ D06P 5/00; B44C 3/02
U.S. Cl. 8—468 28 Claims

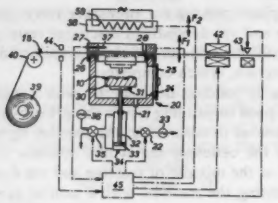



1. A flock transfer sheet comprising a heat-resistant base sheet, a pattern layer overlaid on said base sheet to form a pattern and containing a heat-sublimable or heat-vaporizable dye and a binder as main ingredients, a thickener layer overlaid on said pattern layer to cover at least said pattern and containing as a main ingredient a water-soluble high polymer selected from the group consisting of cellulose derivatives, processed natural rubbers, processed starches, synthetic high polymers and sodium alginate, a pile layer of short fibers electrostatically overlaid on said thickener layer and having dyeability to be dyed with said dye, and a hot melt adhesive layer overlaid on said pile layer for adhering to a matter to which the pattern is transferred, said base sheet being not substantially dyeable with said dye, said thickener layer being not substantially dyeable with said dye but having multiplicity of gas permeable micropores for allowing the dye to penetrate and pass therethrough when the dye is sublimated or vaporized by heating, said thickener layer being reduced in bonding strength to said pile layer to readily release said pile layer when heated, and said dye passing through said thickener layer and dyeing the short fibers of said pile layer to form a dyed pattern to be transferred onto said matter.

## 4,314,814
## METHOD OF AND APPARATUS FOR DECORATING SUBSTRATES

Jean R. Deroode, Lesigny, France, assignor to Essilor International, Cie Generale d'Optique, Creteil, France

Filed Jan. 28, 1980, Ser. No. 115,626
Claims priority, application France, Jan. 30, 1979, 79 02331
Int. Cl.³ B44C *31/00*; B29C *17/00*; B30B *5/02, 5/04*
U.S. Cl. 8—471 3 Claims



1. A method for decorating a substrate in which a flexible support skin is provided carrying an inked pattern, the ink of said inked pattern being sublimable at a temperature below the destruction temperature of the support skin, and an enclosure having an opening in a wall and having means for connecting the opening of the enclosure to a suction source, said method comprising the steps of:

arranging the support skin to sealingly close off the opening in the enclosure with the inked pattern facing inwardly of the enclosure, and disposing in the enclosure the substrate in the immediate proximity of the opening; bringing the suction source into communication with the enclosure to provide an effective suction force and producing at least local intimate contact between the support skin and the substrate and heating the flexible support to a temperature at or above the sublimation temperature of the ink but below the destruction temperature of the support skin; and maintaining the support skin in contact with the substrate for sufficient time to permit sublimation of the ink and transfer of the inked pattern to the substrate.

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## 4,314,815
## PROCESS FOR THE PRODUCTION OF DYESTUFF PREPARATIONS

Hans Mollet, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 880,253, Feb. 22, 1978, abandoned, which is a continuation of Ser. No. 633,340, Nov. 19, 1975, abandoned, which is a continuation of Ser. No. 473,046, May 24, 1974, abandoned, which is a continuation of Ser. No. 224,936, Feb. 9, 1972, abandoned. This application Mar. 14, 1980, Ser. No. 130,305
Claims priority, application Switzerland, Feb. 19, 1971, 2447/71
Int. Cl.³ C09B *67/42, 67/04*
U.S. Cl. 8—524 13 Claims

1. A process for the production of dyestuff compositions, comprising the sequential steps of

(a) subjecting an aqueous suspension of a water-soluble dyestuff and a dispersing agent to a mechanical particle-size-reducing treatment until the dyestuff has a maximum particle size of 10 microns,

(b) drying the dyestuff, and

(c) mixing the dry dyestuff with a basic carbonate or bicarbonate material and a solid acid material.

## 4,314,816
## DIRECT BLUE DYES FROM THE CONDENSATION OF DIAMINOSTILBENEDISULFONIC ACID WITH N-ALKYL OR N-HYDROXYALKYL-8-AMINO-1-NAPHTHOL-3,6-DISULFONIC ACID

Victor Tullio, Wilmington, Del., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed May 30, 1980, Ser. No. 154,868
Int. Cl.³ D06P *67/00*
U.S. Cl. 8—527 17 Claims

1. A dye obtained from the coupling of N-alkylated or N-hydroxyalkylated 8-amino-1-naphthol-3,6-disulfonic acid or its sulfonic acid salts with tertiary amines or alkali metals to the tetrazonium salt of 4,4′-diaminostilbene-2,2′-disulfonic acid whose sulfonic acid groups may have been neutralized with water solubilizing cations after coupling.

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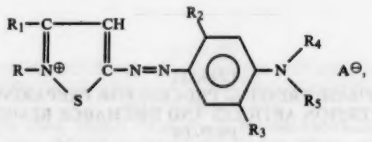
## 4,314,817
## MONOAZO COMPOUNDS HAVING A SUBSTITUTED THIAZOLIUM-5 DIAZO COMPONENT RADICAL AND A SUBSTITUTED 1,4-PHENYLENE COUPLING COMPONENT RADICAL

Berthold Gertisser, Münchenstein, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Aug. 11, 1980, Ser. No. 177,016
Claims priority, application Switzerland, Aug. 16, 1979, 7518/79
Int. Cl.³ C09B *29/22*; D06P *3/00*
U.S. Cl. 8—539 12 Claims

1. A compound of the formula



(I)

wherein

R is $-CH_3$, $-C_2H_5$, $-CH_2CH_2OH$, $-CH_2CH(OH)CH_3$ or $-CH_2CH{=}CH_2$,

$R_1$ is —H or $-CH_3$,

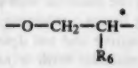
$R_2$ is —H or $-CH_3$,

$R_3$ is $-OCH_3$ or $-OC_2H_5$,

$R_4$ is —H, $-CH_3$, $-C_2H_5$, n-$C_3H_7$, i-$C_3H_7$, $-CH_2CH_2OH$ or $-CH_2CH{=}CH_2$,

$R_5$ is —H, $-CH_3$, $-C_2H_5$, n-$C_3H_7$ or i-$C_3H_7$ or

$R_3$ and $R_5$ taken together are



wherein

$R_6$ is —H or $-CH_3$, and

the * indicates the atom attached to the nitrogen atom, and

$A^{\ominus}$ is an anion.

4,314,818

## 1-AMINO-7-[3'-(5''-CHLORO-2'',4''-DIFLUOROPYRIMIDYL-6''-AMINO)-6'-SULFOPHENYLAZO]-8-HYDROXY-2-SULFAMOYL OR SUBSTITUTED SULFAMOYL-PHENYLAZO NAPHTHALENE-3,6-DISULFONIC ACIDS

Alfred Courtin, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

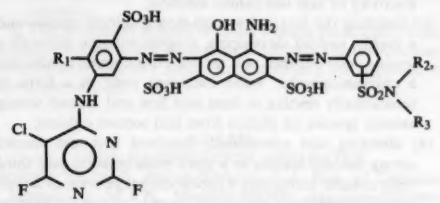
Filed Aug. 11, 1980, Ser. No. 177,017

Claims priority, application Switzerland, Aug. 6, 1979, 7517/79

Int. Cl.³ C09B *62/00, 33/02*

U.S. Cl. 8—549 18 Claims

1. A compound of the formula



or a salt thereof each cation of which is non-chromophoric, wherein

$R_1$ is hydrogen or methyl,

$R_2$ is hydrogen; $C_{1-6}$alkyl; $C_{1-4}$alkyl monosubstituted by halo or phenyl; $C_{2-4}$alkyl monosubstituted in the 2-, 3- or 4-position by hydroxy or $C_{1-2}$alkoxy; $C_{5-7}$cycloalkyl; $C_{5-7}$cycloalkyl substituted by one to three $C_{1-4}$alkyl groups; phenyl; phenyl substituted by one or two substituents selected from the group consisting of halo, $C_{1-4}$alkyl and $C_{1-4}$alkoxy; or $—CH_2CH_2SO_3H$, and

$R_3$ is hydrogen or $C_{1-6}$alkyl, or

$R_2$ and $R_3$, taken together and with the nitrogen atom to which they are bound, form a saturated 5- or 6-membered heterocyclic ring containing no further hetero atom or a saturated 5- or 6-membered heterocyclic ring containing a further hetero atom,

wherein each halo is independently fluoro, chloro or bromo, or a mixture of such compounds in free acid or salt form.

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4,314,819

## FIXATION OF REACTIVE DYES ON CELLULOSIC FIBERS

Christian Oschatz, Schallbach, Fed. Rep. of Germany, assignor to Sandoz Ltd., Basel, Switzerland

Filed Sep. 28, 1978, Ser. No. 946,476

Claims priority, application Switzerland, Sep. 29, 1977, 11913/77

Int. Cl.³ D06P *1/38, 1/673*

U.S. Cl. 8—630 20 Claims

1. In a process wherein a substrate comprising cellulosic fibers is dyed or printed with a reactive dyestuff and then subjected to a treatment under alkaline conditions to effect fixation of the dyestuff, the improvement whereby the alkaline conditions are achieved by treating the substrate with a dyeing liquor or printing paste having present therein both the reactive dyestuff and an aqueous solution of an alkaline system having a pH of 9 to 13 and consisting essentially of 2.5 to 110 g/l of alkali metal silicate 0.1 to 10 g/l of alkali metal borate, 0 to 100 g/l of alkali metal bicarbonate and 0 to 100 g/l of alkali metal carbonate.



4,314,820

## DISTYRYLBENZENE FLUORESCENT BRIGHTENING AGENTS

Kurt Weber, Basel, and Hans R. Meyer, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

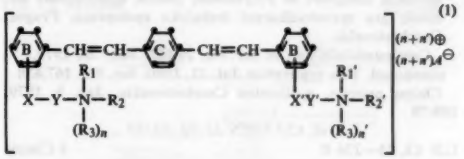
Filed Apr. 2, 1980, Ser. No. 136,615

Claims priority, application Switzerland, Apr. 11, 1979, 3479/79; Jun. 26, 1979, 5951/79

Int. Cl.³ C09K *11/06*

U.S. Cl. 8—648 25 Claims

1. A distyrylbenzene of the formula



(1)

in which X and X' independently of one another are —COO— or —CON($R_4$— in the o-position, a direct bond, oxygen, sulfur, —O—$C_{1-3}$-alkylene—CON($R_4$)—, —$SO_2$N($R_4$—, —O—$C_{1-3}$-alkylene—COO— or —OCO—, Y and Y' independently of one another are $C_{1-20}$-alkylene, $R_1$ and $R_1'$ independently of one another are unsubstituted or substituted $C_{1-8}$-alkyl or $C_{3-4}$-alkenyl, or $R_1$ together with $R_2$, or $R_1'$ together with $R_2'$, is a heterocyclic ring, $R_2$ and $R_2'$ independently of one another are unsubstituted or substituted $C_{1-8}$-alkyl or $C_{3-4}$-alkenyl, or $R_2$ together with $R_1$, or $R_2'$ together with $R_1'$, is a heterocyclic ring, or $R_1$ and $R_2$, or $R_1'$ and $R_2'$, together with $R_3$ are a pyridine or picoline ring, $R_3$ is hydrogen, unsubstituted or substituted $C_{1-4}$-alkyl or $C_{3-4}$-alkenyl, or together with $R_1$ and $R_2$ or with $R_1'$ and $R_2'$ is a pyridine or picoline ring, $R_4$ is hydrogen or unsubstituted or substituted $C_{1-6}$-alkyl, $A^{\ominus}$ is a colourless anion and n and n' independently of one another are the number 0 or 1, and the benzene nuclei B and C can also be substituted by non-chromophoric substituents.

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4,314,821

## SANDWICH IMMUNOASSAY USING PIEZOELECTRIC OSCILLATOR

Thomas K. Rice, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 28,348, Apr. 9, 1979, Pat. No. 4,236,893. This application Jul. 28, 1980, Ser. No. 172,755

The portion of the term of this patent subsequent to Dec. 6, 1997, has been disclaimed.

Int. Cl.³ G01N *33/54;* H01L *41/00*

U.S. Cl. 23—230 B 12 Claims

1. In a method for determining the total amount of an immunologically-reactive substance in a liquid sample containing interfering material capable of binding to an antigen comprising the steps of: (1) contacting a liquid sample containing or suspected of containing an antibody with the surface of a piezoelectric oscillator having a layer of antigen specific for said antibody attached thereto; (2) washing and drying said oscillator; and (3) measuring the resonance frequency of said oscillator, the improvement comprising the further steps of: (4) contacting said surface of said oscillator with a liquid reagent containing an excess amount of a substance specifically reactive with all of said antibody bound to said oscillator in step (1); (5) washing and drying said oscillator; and (6) measuring the change in resonance frequency of said oscillator from said first measurement whereby the amount of total antibody bound to said oscillator in step (1) is distinguished from said interfering material bound in said step (1).

8. A diagnostic test kit for the quantitative determination of the total amount of an immunologically-reactive substance in a

liquid sample containing interfering material capable of binding to an antigen comprising:

a piezoelectric oscillator having a layer of antigen attached thereto; and

a reagent containing an excess amount of a substance reactive with all of the antibody reactive with said antigen.

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**4,314,822**

## METHOD FOR CHECKING THE INTENSITY OF DESTRUCTION OF MALIGNANT CELLS IN THE HUMAN BODY

**Ivan Dolejší, and Miloslav Spůr, both of Dvůr Králové, Czechoslovakia, assignors to Polytechna, podnik zahranicniho obchodu pro zprostredkovani technicke spoluprace, Prague, Czechoslovakia**

**Continuation-in-part of Ser. No. 24,665, Mar. 28, 1979, abandoned. This application Jul. 11, 1980, Ser. No. 167,428**

**Claims priority, application Czechoslovakia, Jan. 9, 1979, 199-79**

**Int. Cl.³ G01N *31/02, 33/50***

**U.S. Cl. 23—230 B** **8 Claims**

1. Method for monitoring the destruction of malignant cells in the human body by determining the presence of alcoholate metabolites of malignant cells secreted in urine by the human body which comprises the steps of

(a) adding a predetermined quantity of an aliphatic acid selected from the group consisting of palmitic and stearic acid to a urine sample, the urine having a pH value within the range of 5.6–5.85, and

(b) maintaining the resultant mixture at a temperature within the range of 80°–85° C. for a predetermined period of time; the presence of alcoholate metabolites of malignant cells being determined quantitatively by esterification of the aliphatic acid thereby.

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**4,314,823**

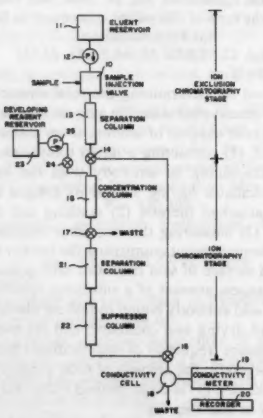
## COMBINATION APPARATUS AND METHOD FOR CHROMATOGRAPHIC SEPARATION AND QUANTITATIVE ANALYSIS OF MULTIPLE IONIC SPECIES

**William E. Rich, Jr., Mountain View; Frank C. Smith, Felton, and Janet L. McNeill, Sunnyvale, all of Calif., assignors to Dionex Corporation, Sunnyvale, Calif.**

**Continuation-in-part of Ser. No. 17,575, Mar. 5, 1979, abandoned. This application Sep. 13, 1979, Ser. No. 75,260**

**Int. Cl.³ G01N *31/04, 31/08***

**U.S. Cl. 23—230 R** **27 Claims**




1. The method of chromatographic separation and quantitative analysis of a plurality of anionic species in a sample solution, said method comprising

(a) directing a sample solution containing a plurality of anionic species and an eluent through a first resin column, said first column containing a cationic or non-ionic chromatographic resin in a form to substantially resolve at least a first weak anionic species member, having a $pK_A$ value of about 2 to 7, from a group of anionic species including at least first and second strong anionic species members, having $pK_A$ values of about 0 to 2, on elution from said column in said eluent,

(b) directing a solution of at least said substantially resolved first weak anionic species through a conductivity cell having associated readout means and measuring the conductivity of said last named solution,

(c) directing the first and second strong anionic species and a highly ionized developing reagent solution through a second resin column, said second resin column containing a chromatographic anion exchange resin in a form to substantially resolve at least said first and second strong anionic species on elution from said second column,

(d) directing said substantially resolved first and second strong anionic species to a third resin column, said third resin column containing a cation exchange resin of a type which substantially precludes passage of the developing reagent in highly ionized form and which permits passage of said resolved first and second strong anionic species without substantiall interruption of the resolution, and P1

(e) directing a solution of the resolved first and second strong anionic species from said third resin column through a conductivity cell having associated readout means and measuring the conductivity of said last named solution.

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**4,314,824**

## PROGRAMMABLE, CONTINUOUS FLOW ANALYZER

**Elo H. Hansen, Lyngby, and Jaromir Ruzicka, Naerum, both of Denmark, assignors to Bifok AB, Sollentuna, Sweden**

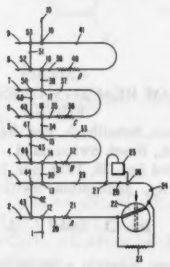
**Continuation of Ser. No. 878,265, Feb. 16, 1978, Pat. No. 4,224,033. This application May 6, 1980, Ser. No. 147,331**

**Claims priority, application Sweden, Feb. 16, 1977, 7701692**

**The portion of the term of this patent subsequent to Sep. 23, 1997, has been disclaimed.**

**Int. Cl.³ G01N *1/18***

**U.S. Cl. 23—230 R** **9 Claims**



1. A method of preparing a sample for treatment in which a continuous flow of liquid carrier receives sample portions, said method comprising: passing said carrier through a conduit in a manner such that flow of said carrier is laminar, unsegmented and continuous, introducing sample portions into said carrier, controlling dispersion of said sample portion in said carrier by varying at least one of the following: the volume of said sample portion, the flow velocity of said carrier, or the dimensions of said conduit conducting said sample and said carrier.

4,314,825

## PROCESS OF PREPARING COMBUSTIBLE SOLID FUEL

Gerald J. Paquette, 2716 - 29th Ave. Northeast, Minneapolis, Minn. 55418

Filed Aug. 26, 1980, Ser. No. 181,487
Int. Cl.³ C10L 5/44
U.S. Cl. 44—10 A 4 Claims

1. The process of preparing a combustible solid fuel from grain residue which comprises the steps of:

(a) passing grain residue through a pelletizing zone wherein the said residue is subjected to a compaction pressure of greater than about 500 psi with said compaction pressure being maintained while passing live steam therethrough, with these conditions being maintained for a period of time sufficient to cause the insitu cellulose to become cohesive.

2. The process as defined in claim 1 being particularly characterized in that said grain residue is subjected to said compaction pressure and live steam simultaneously for a period of about one second.

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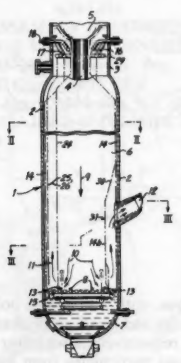
4,314,826

## COAL GASIFICATION APPARATUS

Frohmut Vollhardt, Siegen-Bürbach, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 18, 1980, Ser. No. 178,902
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1979, 2933514
Int. Cl.³ C10J 3/48, 3/52
U.S. Cl. 48—77 10 Claims



1. Apparatus including a coal gasification reactor and a device for the treatment of synthesis gas produced in the coal gasification reactor comprising a vertically extending shell forming a gas distribution space within said shell connected with the interior of the coal gasification reactor and operating under an internal pressure related to the pressure in the reactor, heat exchanger tubes located within said shell and including first heat exchanger tubes arranged along the inside wall of said shell, wherein the improvement comprises that said first heat exchanger tubes form a cylindrically shaped wall lining the interior of said shell and extend in the vertical direction of said shell, said heat exchanger tubes including second heat exchanger tubes coextensive with said first heat exchanger tubes and in combination therewith forming a plurality of upwardly extending individual chambers projecting radially inwardly toward and angularly spaced apart about the vertical axis of said cylindrically shaped wall and extending for substantially the vertical height of said heat exchanger tubes in said cylindrically shaped wall, means within said chambers for conducting a cleaning medium therethrough under a higher pressure than the pressure in said gas distribution space and said means being arranged for directing the cleaning medium approximately tangentially of said first heat exchanger tubes located between adjacent said chambers for cleaning the surfaces of said tubes.

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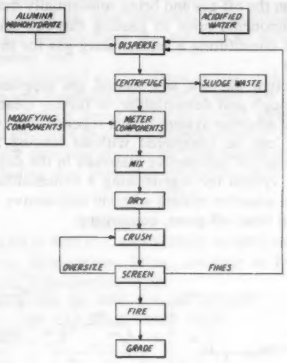
4,314,827

## NON-FUSED ALUMINUM OXIDE-BASED ABRASIVE MINERAL

Melvin A. Leitheiser, Stillwater, and Harold G. Sowman, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 53,347, Jun. 29, 1979, abandoned. This application May 13, 1980, Ser. No. 145,383
Int. Cl.³ C04B 35/10
U.S. Cl. 51—298 22 Claims




1. Method of making dense, synthetic, aluminum oxide-based granular abrasive mineral having a substantially homogeneous microcrystalline structure of randomly oriented crystallites comprising modifying component in a dominant continuous alumina phase comprising alpha-alumina, said

(a) gelling a substantially calcium ion- and alkali metal ion-free homogeneous mixture of an alumina source compound and at least one precursor of at least one modifying component selected from

(i) zirconia, hafnia, or a combination of zirconia and hafnia, and

(ii) a spinel derived from alumina and at least one oxide of a metal selected from cobalt, nickel, zinc, or magnesium,

said precursor being present in an amount to provide in said mineral a dominant continuous alumina phase comprising alpha-alumina and a modifying component content, on a volume percent of fired solids of the mineral, of either (a) at least 10% of said (i), (b), at least 1% of said (ii), or (c) at least 1% of said (ii) and 1–45% of said (i),

(b) drying the gelled mixture to form chunky pieces of solid material, and

(c) firing said solid material in a non-reducing atmosphere to a temperature of at least 1250° C., but not above the melting point of said mineral, to remove fugitive materials and to nondestructively convert said solid material to a dense aluminum oxide-based mineral.

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4,314,828

## METHOD AND SYSTEM FOR REGENERATING DEHUMIDIFIER FOR USE IN CHARCOAL ADSORBER

Toru Saito, and Masaki Takeshima, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 14, 1980, Ser. No. 121,460
Claims priority, application Japan, Feb. 14, 1979, 54-15907
Int. Cl.³ B01D 53/04, 59/26
U.S. Cl. 55—26 15 Claims

1. A method of regenerating a dehumidifier, of the type

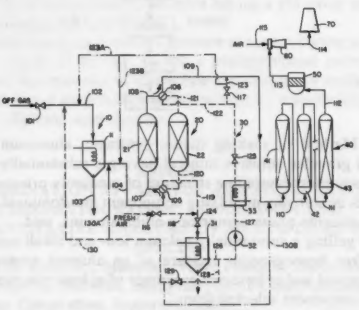
which absorbs moisture from an off-gas including radioactive noble gas such as xenon and krypton to remove moisture therefrom, after said dehumidifier has been used to remove moisture from said off-gas, said method comprising:

purging the dehumidifier by passing a first supply of purging gas therethrough to blow away radioactive materials retained in the dehumidifier after use of the dehumidifier to remove moisture from said off-gas, said first supply of purging gas being separate from the off-gas and being substantially free of radioactive components prior to passing through said dehumidifier,

regenerating the dehumidifier by passing a second supply of gas in a heated state to remove moisture absorbed in the dehumidifier, said second supply of gas being separate from the off-gas and being substantially free of radioactive components prior to passing through said dehumidifier and constituting a regenerating gas for the dehumidifier, and

subjecting the first and second gas supplies, after passage through said dehumidifier, to further treatment in a charcoal adsorber system so that regeneration of the dehumidifier can be completed without leaving any substantial amount of radioactive materials in the dehumidifier.

10. A system for regenerating a dehumidifier, for use in a charcoal adsorber system wherein radioactive noble gases are adsorbed from off-gases, comprising:



dehumidifiers, which include desiccant and through which off-gas including radioactive noble gases such as xenon or krypton is dehumidified,

charcoal adsorbing means, where dehumidified off-gas is introduced and radioactive materials are adsorbed until radioactivity of the off-gas is decayed,

first supply means for supplying a first gas through said dehumidifier for purging radioactive materials retained in the dehumidifier after passage of off-gas therethrough, said first gas being separate from the off-gas and being substantially free of radioactive contaminants, and means for passing said first gas from said first supply means through the dehumidifier,

regenerating means for regenerating said dehumidifier, said regenerating means including a second supply means for supplying a second gas through the dehumidifier and means for passing the second gas from said second supply means in a heated state through said dehumidifier so that the moisture retained in said dehumidifier after passage of the off-gas therethrough is removed with the heated second gas, said second gas being separate from the off-gas and being substantially free of radioactive components, and

means for introducing the first gas to said charcoal adsorbing means after the first gas has been used to purge said dehumidifier, and means for introducing the second gas to said charcoal adsorbing means after the second gas has been used to regenerate said dehumidifier.

## 4,314,829
## PARTICULATE FILTER METHOD

James B. Madsen, Marietta, and Daniel R. Brown, Atlanta, both of Ga., assignors to International Minerals & Chemical Corporation, Terre Haute, Ind.

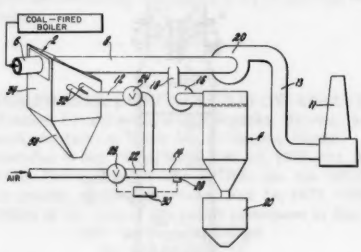
Filed Jun. 26, 1980, Ser. No. 163,448
Int. Cl.[3] B01D 43/30
U.S. Cl. 55—98 10 Claims

1. In a method of removing finely dispersed, particulate material suspended in a gaseous atmosphere in a facility for making a blended solid, granular fertilizer product consisting essentially of inorganic salts selected from the group consisting of phosphorus, potassium and nitrogen and mixture thereof, said finely dispersed, particulate material being generated from the product being blended during blending, the improvement comprising the step of circulating the gaseous atmosphere having finely dispersed, particulate material suspended therein through a dry filter bed consisting essentially of dry, gas permeable particles of at least one inorganic salt component of the blended solid, granular fertilizer product.

## 4,314,830
## SIDE STREAM SEPARATOR FOR BOILER PARTICULATE EMISSION CONTROL

David A. Skiven, Plymouth Township, Wayne County; Charles J. Sortor, St. Clair Shores, and Raymond J. Tessier, Allen Park, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 23, 1980, Ser. No. 142,972
Int. Cl.[3] B01D 50/00; C21B 7/22
U.S. Cl. 55—217 1 Claim




1. In combination with a coalfired boiler emitting a hot, effluent rich in large and small particulates above and below about 10 microns respectively, a separator system for substantially removing said particulates from said effluent prior to discharging said effluent to a stack, said system comprising: a primary separator including a housing, inlet and outlet chambers in said housing, a particulate collection chamber beneath said inlet chamber, a partition separating the collection chamber from the inlet chamber and a plurality of cyclonic separator tubes extending through the partition providing effluent flow communication between said inlet, outlet and collection chambers, said cyclonic tubes each comprising spaced-apart inner and outer concentric tubes for whirling said particulate-rich effluent downwardly therebetween to centrifugally separate primarily said large particulates from said effluent for collection in said collection chamber and to yield a particulate-lean effluent containing primarily said small particulates for passage into said outlet chamber through said inner tube; and exhaust duct means communicating said outlet chamber with said stack; first suction means for drawing said effluent from said outlet chamber and through said exhaust duct means for discharge to said stack; and a secondary separator for substantially completely removing said small particulates from a minor portion of said particulate-lean effluent, said secondary separator comprising a vestibule chamber, an exhaust chamber, porous, effluent-sensitive filter media between said vestibule and exhaust chambers for entrapping said small particulates

from said portion and substantially preventing their passage from said vestibule chamber into said exhaust chamber so as to yield a substantially particulate-free effluent from said exhaust chamber; a first conduit communicating said collection chamber with said vestibule chamber for passing said portion to said vestibule chamber; valve means positioned and arranged in said first conduit for controlling the flow of said minor portion through said secondary separator; a second conduit communicating said exhaust chamber with said exhaust duct means for passing said particulate-free effluent to said stack; second suction means for drawing said portion from said collection chamber through said secondary separator and said first and second conduits for discharge to said exhaust duct means and said stack, said second suction means being positioned and arranged such that it additionally creates a downward pull in said collection chamber for enhancing the collection efficiency of said primary separator with respect to said large particulates and reducing reentrainment of said small particulates in said particulate-lean effluent; inlet duct means positioned and arranged for admitting ambient air into said first conduit; motorized valve means positioned and arranged in said inlet duct means for modulating the admission of ambient cooling air into said first conduit for dilution cooling of said portion; means for sensing the temperature of the portion in said first conduit; and control-means connected to said sensing and said motorized valve means for controlling said motorized valve means in response to the temperature of said portion and such as to maintain the temperature of the gas entering said second separator above its acid dew point and below the thermal degradation temperature of said media.

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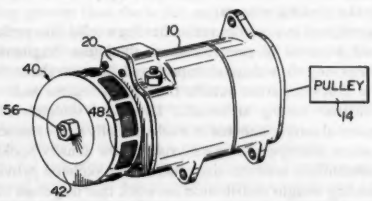
**4,314,831**

## AIR FILTER ASSEMBLY IN COMBINATION WITH MOTOR VEHICLE GENERATOR

**Mato Barbic, #613–2012 Fullerton Ave., North Vancouver, British Columbia, Canada (V7P 2E3)**

**Filed Jun. 9, 1980, Ser. No. 157,475**
**Int. Cl.³ B01D *46/52;* H02K *9/26***
**U.S. Cl. 55—385 R** **16 Claims**




**1.** An air filter assembly in combination with and joined to a motor vehicle generator, said air filter assembly comprising:

(a) an adaptor plate and connecting means rigidly connecting said adaptor plate to one end of said generator, said adaptor plate including an aperture positioned and arranged to provide air flow communication between the assembly and said generator;

(b) an air filter element; and,

(c) a housing enclosing a chamber, said housing including:

(i) an air outlet aperture communicating between said chamber and said adaptor plate aperture;

(ii) a plurality of air inlet apertures communicating between said chamber and the atmosphere surrounding said housing; and,

(iii) a circular threaded collar threadably engaged to said adaptor plate;

said air filter element being removably disposed in said chamber between said air outlet aperture and said plurality of air inlet apertures for directing cooling air flow to said generator, while excluding particulate foreign matter from said cooling air flow.

**10.** An air filter assembly in combination with and joined to a motor vehicle generator, said air filter assembly comprising:

(a) an adaptor, including:

(i) a sleeve joined to one end of said generator;

(ii) an adaptor plate having a first side, a second side, and an aperture positioned and arranged to provide air flow communication between the assembly and said generator, said first side being circumferentially affixed to an end of said sleeve; and,

(iii) a first threaded collar affixed to said second side of said plate around said aperture;

(b) an air filter element; and,

(c) a housing enclosing a chamber, said housing including:

(i) an air outlet aperture communicating between said chamber and said adaptor plate aperture;

(ii) a plurality of air inlet apertures communicating between said chamber and the atmosphere surrounding said housing; and

(iii) a second threaded collar affixed around said air outlet aperture and threadably engaged to said first collar;

said air filter element being disposed in said chamber between said air outlet aperture and said plurality of air inlet apertures for directing cooling air flow to said generator, while excluding dust from said cooling air flow.

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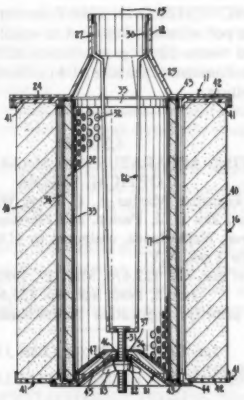
**4,314,832**

## AIR CLEANER WITH CARTRIDGE SUSPENSION

**Michael E. Fox, Minneapolis, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.**

**Filed Jul. 24, 1980, Ser. No. 171,658**
**Int. Cl.³ B01D *46/52, 50/00***
**U.S. Cl. 55—482** **6 Claims**



**1.** An air cleaner comprising, in combination:

a support member having an axis, an axial air flow connection, and mounting means extending along said axis for applying compressive force in a direction generally towards said connection;

a first hollow filter cartridge having a first flat surface;

clamping means constructed and arranged to cooperate with said mounting means for securing said first filter cartridge to said support member with said flat surface extending generally transversely with respect to said axis;

a second hollow filter cartridge having an end with a radially extending lip; and

a second flat surface on one of said support member and said clamping means, said second flat surface apposed to said first flat surface, said lip being disposed between said flat surfaces such that said flat surfaces cooperate to grip therebetween said lip of said second filter cartridge so as

to suspend said second filter cartridge from said support member.

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4,314,833

## METHOD OF PRODUCING OPTICAL FIBERS

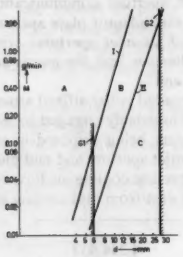
Dieter Küppers, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 16, 1980, Ser. No. 169,348

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1979, 2929166

Int. Cl.³ C03B 37/075

U.S. Cl. 65—3.12 8 Claims



4. A method of producing internally coated glass tubes by depositing a coating of glass layers on the interior to the tube, said method comprising the steps of:

introducing a reactive gas mixture into the tube; and

forming a nonisothermal plasma zone within a portion of the tube;

CHARACTERIZED IN THAT the deposition rate, M, in grams per minute is less than or equal to the product of 5.0836 times $10^{-4}$ grams/minute-millimeter times the inside diameter of the tube, d, in millimeters at the time of deposition.

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4,314,834

## COATING APPARATUS FOR MANUFACTURING OPTICAL FIBERS

Johannes Feenstra; Marius A. F. Klop; Wilhelmus C. P. M. Meerman; Jan G. J. Peelen, and Hermanus N. Tuin, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 132,470, Mar. 19, 1980. This application Jun. 2, 1980, Ser. No. 155,696

Claims priority, application Netherlands, Mar. 21, 1979, 7902201

Int. Cl.³ C03C 25/02; C03B 37/025

U.S. Cl. 65—11.1 7 Claims

1. An apparatus for manufacturing optical fibers comprising:

means for holding and feeding a preform;

means for heating the preform received from the holding and feeding means;

means for drawing an optical fiber from the heated preform, said optical fiber having a substantially circular cross-section; and

means for providing a protective coating on the fiber, said coating means comprising a funnel provided with a nozzle opening at an outlet end, said nozzle having a polygonal shape and having suitable dimensions such that a circle, having a diameter greater than the outside diameter of the fiber to be coated, may be inscribed in the nozzle opening.

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4,314,835

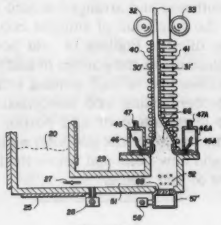
## METHOD OF PRODUCING FOAMED CONSTRUCTION MATERIALS

Robert S. Pelton, 1400 S. Joyce St., Apt. A-1603, Arlington, Va. 22202

Filed Mar. 10, 1980, Ser. No. 128,887

Int. Cl.³ C03B 19/08

U.S. Cl. 65—22 11 Claims



1. The method of making a foamed article providing uniform density and cell size, insulation properties, long life without protective coatings when exposed to the atmosphere, strength and fracture resistance suitable for weight bearing construction applications having the properties in combination to achieve the foregoing features comprising,

(a) a solid poreless material that is meltable at high temperatures moldable into predetermined shapes and temperable in the cooling process,

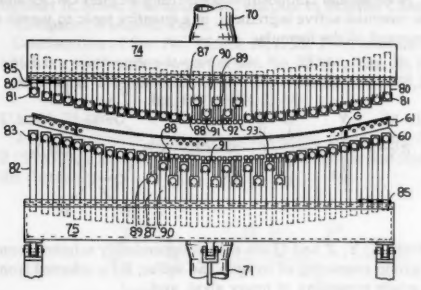
(b) produced in a configuration having a solid skin surface of said material of predetermined thickness toughened by tempering to withstand impact and to resist shattering of the skin over areas outside the impact region, and

(c) further having an interior structural skeleton of said material interconnected in a substantially non-symmetrical pattern interspersed by a myriad of low density pockets of substantially uniform size wherein the skeleton provides a bearing weight distribution network that disperses impact shock over widely dispering skeletal paths encompassing the pockets and further prevents any common pathway through the body of the object than can support a fracture line through the object, whereby there is an ability of the configuration to absorb shock and impact and to support substantial bearing weight while being light and having substantial insulating capacity over a long life by introducing means forming the low density pockets of predetermined substantially constant size into molten material confined in a mold tempering and forming said skin surface from the molten material, permitting the pockets to rise through the molten material in said mold to a position being cooled and hardened thereby to form the bubbles in said interior structural skeleton by hardening of the molten material about the pockets, continuously moving the article through said mold while controlling the mold temperature to cool the skin of the article in a predetermined manner thereby to temper the outer surfaces of the article, and providing a stream of molten material from a furnace into said mold to replenish the material continuously withdrawn by said article.

## 4,314,836
## GLASS SHEET TEMPERING APPARATUS WITH NOZZLE ARRANGEMENT PROVIDING FLUID ESCAPE PATHS AND METHOD OF TEMPERING GLASS SHEETS

Samuel L. Seymour, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 4, 1980, Ser. No. 174,961
Int. Cl.³ C03B 27/04
U.S. Cl. 65—114 13 Claims



1. In a method of tempering a glass sheet, wherein the method includes the steps of heating a sheet to a temperature sufficient for tempering; applying streams of tempering medium over major surfaces of the sheet at a rate sufficient to impart at least a partial temper to the sheet, the tempering medium escaping along a plurality of adjacent paths, each of the paths having a depth as measured along a line generally normal to the major surface of the glass sheet, and a width as measured along a line generally parallel to the major surface of the glass sheet, the improvement comprising:

increasing the width and depth of the path adjacent central portion of the sheet to a fixed width and depth during the practice of the applying step, the fixed width and depth being greater than the width and depth of the paths adjacent sheet portions outside the central portion to increase the volume of tempering medium escaping from adjacent the central portion of the sheet to improve the temper of the sheet and provide a more uniform break pattern.

6. An apparatus for tempering a glass sheet, comprising:

first means for directing a tempering medium;

second means for directing a tempering medium;

means for mounting said first and second directing means in spaced relation to one another to direct tempering medium toward one another through a common tempering position; and

each of said directing means comprising:

a central fixed array of delivery means, said central fixed array of delivery means spaced a fixed distance from the common tempering position;

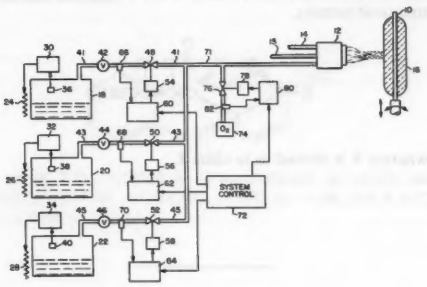
a plurality of spaced fixed outer array of delivery means about said central array of delivery means, said spaced fixed outer array spaced a distance from the common tempering position that is less than the fixed distance of the central fixed array; and

a plurality of elongated pipes having a cross-sectional dimension substantially less than the surface dimension of said fixed outer array facing the common tempering position, each of said pipes extending from said central fixed array of delivery means toward the common tempering position and terminating short of the common tempering position a distance approximately equal to the spaced distance from the common tempering position as the spaced outer fixed array of delivery means, said plurality of elongated pipes and spaced central fixed array of delivery means provides increased volumetric tempering medium escape path in a direction generally parallel to and normal to the common tempering position for central portion of said directing means as compared to outer portions.

## 4,314,837
## REACTANT DELIVERY SYSTEM METHOD

Michael G. Blankenship, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 1, 1979, Ser. No. 16,446
Int. Cl.³ C03C 25/02
U.S. Cl. 65—3.12 3 Claims




1. A method for forming an optical fiber preform by depositing on a substrate by means of the oxidation a mixture of at least two reactants in vapor form, said method comprising the steps of

providing a heated reaction zone adjacent said substrate surface,

supplying first and second reactants in liquid form in first and second pressurized containers, respectively,

heating each of said containers to a temperature sufficient to maintain within each said container a predetermined minimum vapor pressure,

supplying vapors from said containers to said reaction zone,

sensing the rate of flow of vapors from each of said containers,

controlling the flow of vapors from each of said containers in response to the sensed flow rate of vapors therefrom,

combining the vapors from said first and second containers, and

mixing oxygen with said vapors after the flow of said vapors has been controlled, whereby a precisely metered amount of constituent vapors can be obtained from a container without passing oxygen through said container.

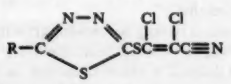
## 4,314,838
## BIOCIDAL THIADIAZOLYLMERCAPTO-SUBSTITUTED HALOACRYLONITRILE COMPOUNDS

Raymond A. Felix, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

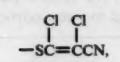
Division of Ser. No. 172,355, Jul. 25, 1980. This application Mar. 2, 1981, Ser. No. 239,281
Int. Cl.³ A01N 43/82
U.S. Cl. 71—67 4 Claims

1. A biocidal composition of matter comprising

a. a biocidally effective amount of a compound having the structural formula



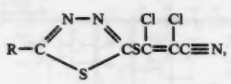
wherein R is selected from the group consisting of methyl, ethyl, propyl, butyl,



phenyl and substituted phenyl wherein the substituents are selected from the group consisting of —$CH_3$, —$CF_3$, —$NO_2$, —Br and —Cl; and

b. an inert carrier.

3. A process for the control of bacteria, fungi and algae comprising applying to the locus of said bacteria fungi and algae a biocidally effective amount of a compound having the structural formula



wherein R is defined as in claim 1.

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4,314,839

## 1,2,3-THIADIAZOLE-5-CARBOXYLIC ACID AMIDE DERIVATIVES, PROCESS FOR MAKING THE SAME AND HERBICIDAL GROWTH REGULATING DEFOLIATING AND FUNGICIDAL COMPOSITIONS CONTAINING SAME

Hans-Rudolf Krüger; Friedrich Arndt; Dietrich Baumert, and Reinhart Rusch, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

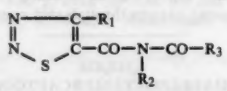
Filed Mar. 18, 1980, Ser. No. 131,354

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1979, 2913977

Int. Cl.³ A01N *43/82;* C07D *285/06, 412/12*

U.S. Cl. 71—73 45 Claims

1. 1,2,3-thiadiazole-5-carboxylic acid amide derivatives of the formula



wherein

$R_1$ is methyl,

$R_3CO$ is acetyl, crotonyl, chloroacetyl, dichloroacetyl, propionyl, isobutyryl, valeryl, cinnamoyl, furoyl, 4-methyl-1,2,3-thiadiazol-5-ylcarbonyl, cyclopropylcarbonyl, cyclohexylcarbonyl, dichlorophenoxyacetyl, phenoxybenzoyl, benzoyl, halobenzoyl, dichlorobenzoyl, dichloromethoxybenzoyl, methylbenzoyl or trifluoromethylbenzoyl, and

$R_2$ is benzyl, halobenzyl, cyclohexyl, methylcyclohexyl or cyclohexylmethyl.

42. A composition having herbicidal, growth regulating and defoliating activity in which at least one of the active agents is a compound as defined in claim 1, the said active agent being present in amounts of about 5 to 95% by weight, the composition including about 95 to 5% by weight of liquid or solid carrier materials.

4,314,840

## CYCLIC ACETAL-METHYL-CARBAMOYL-METHYL ESTERS OF PHOSPHONIC AND PHOSPHORIC ACIDS, AS HERBICIDES

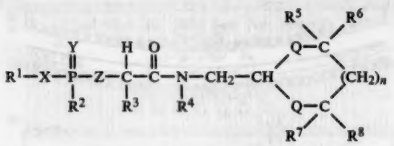
Leonard J. Stach, Riverside, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 61,132, Jul. 26, 1979, Pat. No. 4,237,056. This application Jun. 30, 1980, Ser. No. 164,719

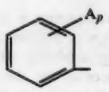
Int. Cl.³ A01N *43/24, 43/30, 43/32*

U.S. Cl. 71—87 2 Claims

1. A herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds a compound of the formula

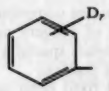


wherein X, Y, Z and Q are each independently selected from the group consisting of oxygen and sulfur; $R^1$ is selected from the group consisting of lower alkyl, and

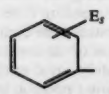


wherein A may be different at different positions and is selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, halogen, nitro and cyano, and p is an integer from 0 to 5; $R^2$ is selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, amino, lower alkylamino, lower dialkylamino and

wherein B may be different at different positions and is selected from the group consisting of lower alkyl, lower alkoxy, lower akylthio, halogen, nitro and cyano, and q is an integer from 0 to 5; $R^3$ is selected from the group consisting of hydrogen, lower alkyl and



wherein D may be different at different positions and is selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, halogen, nitro and cyano, and r is an integer from 0 to 5; $R^4$ is selected from the group consisting of hydrogen, lower alkyl, lower cycloalkyl and



wherein E may be different at different positions and is selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, halogen, nitro and cyano, and s is an integer

from 0 to 5; $R^5$, $R^6$, $R^7$, and $R^8$ are each independently selected from the group consisting of hydrogen and lower alkyl; and n is an integer from 0 to 3.

2. A method of controlling weeds which comprises contacting said weeds with a herbicidally effective quantity of a herbicidal composition of claim 1.

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**4,314,841**

**BENZYL THIOCARBAMATE SULFOXIDES STABILIZED WITH CALCIUM CARBONATE CARRIER**

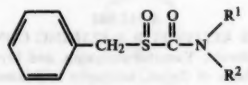
**Herbert B. Scher, Moraga, Calif., assignor to Stauffer Chemical Company, Westport, Conn.**

**Continuation of Ser. No. 96,952, Nov. 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 23,864, Mar. 26, 1979, abandoned. This application Feb. 17, 1981, Ser. No. 235,216**

**Int. Cl.³ A01N *25/22***

**U.S. Cl. 71—88** **28 Claims**

1. In a granular herbicidal composition comprising from 0.5% to 50% by weight of a benzyl thiocarbamate sulfoxide of the formula



in which

$R^1$ and $R^2$ are independently selected from the group consisting of $C_1$–$C_6$ alkyl, $C_2$–$C_6$ alkenyl, and $C_2$–$C_6$ alkynyl, or

$R^1$ and $R^2$ conjointly form $C_3$–$C_{10}$ alkylene; and

from 50% to 99.5% by weight of a carrier, the improvement comprising the use of calcium carbonate as the carrier to improve the thermal stability of the benzyl thiocarbamate sulfoxide.

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**4,314,842**

**HERBICIDAL SUBSTITUTED 1,3,4-THIADIAZOL-2-YL-4-HYDROXY-1-METHYL-2-IMIDAZOLIDINONES**

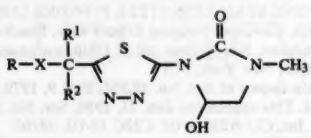
**Jerome M. Lavanish, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 65,694, Aug. 10, 1979, abandoned, and Ser. No. 79,277, Sep. 27, 1979, abandoned. This application Oct. 8, 1980, Ser. No. 195,146**

**Int. Cl.³ A01N *43/82*; C07D *417/04***

**U.S. Cl. 71—90** **7 Claims**

1. Compounds represented by the formula:



wherein:

R is alkyl containing up to 4 carbon atoms;

$R^1$ is hydrogen or alkyl containing up to 4 carbon atoms;

$R^2$ is hydrogen, alkyl or haloakyl containing up to 4 carbon atoms, alkenyl containing up to 3 carbon atoms, or alkynyl containing up to 3 carbon atoms; and

X is oxygen or sulfur.

7. In a method of controlling weed growth wherein a herbicidally effective amount of herbicide is either applied to the growth medium prior to emergence of the weeds or applied to the weed subsequent to emergence from the growth medium wherein the improvement resides in using as the herbicide a herbicidally effective amount of a compound or mixture of compounds defined in claim 1.

**4,314,843**

**1-BENZOYL-3-HYDROXY-6(1H)-PYRIDAZINONES EMPLOYED AS PLANT GROWTH REGULATORS**

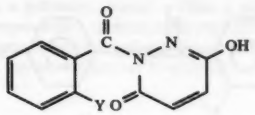
**Otto L. Hoffmann, Wilmington, Del., and Natu R. Patel, Overland Park, Kans., assignors to Gulf Oil Corporation, Pittsburgh, Pa.**

**Division of Ser. No. 124,991, Mar. 13, 1980, Pat. No. 4,256,884. This application Oct. 6, 1980, Ser. No. 194,502**

**Int. Cl.³ A01N *43/58***

**U.S. Cl. 71—92** **15 Claims**

1. The method of regulating plant growth comprising applying to plants an effective amount of a compound having the structural formula



in which Y is —COOH or an agriculturally acceptable salt thereof, —COOR, —$CH_2$OH, —CHO, or —OR, and R is $C_1$ to $C_4$ alkyl or alkenyl.

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**4,314,844**

**HERBICIDAL SUBSTITUTED IMIDAZOLES**

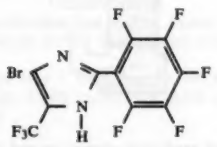
**Colin Swithenbank, Perkasie, and Ted T. Fujimoto, Warminster, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.**

**Continuation-in-part of Ser. No. 2,518, Jan. 11, 1979, abandoned. This application Jan. 10, 1980, Ser. No. 110,968**

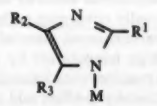
**Int. Cl.³ A01N *43/50*; C07D *233/68, 233/54***

**U.S. Cl. 71—92** **10 Claims**

1. A compound of the formula



2. A herbicidal composition comprising an effective amount of a compound of the formula:



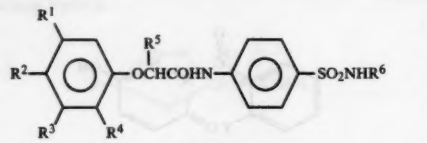
wherein $R^1$ is phenyl or naphthyl which may be substituted with up to 5 substituents selected from bromo, chloro, fluoro, trifluoromethyl, cyano, nitro, ($C_1$–$C_4$) alkyl, ($C_1$–$C_4$) alkylthio, ($C_1$–$C_4$) alkylsulfonyl, ($C_1$–$C_4$) alkylamino, or ($C_1$–$C_4$) dialkylamino; $R^2$ is selected from halo or trifluoromethyl; $R^3$ is trifluoromethyl and M is hydrogen or an alkali or alkaline earth metal in an agronomically acceptable carrier.

## 4,314,845
## $N^4$-PHENOXYALKANOYLSULFANILAMIDES AND HERBICIDAL COMPOSITION CONTAINING THE SAME

Kanji Ito, Hirakata; Kenji Ikawa, Osaka; Hisajiro Yukinaga, Kusatsu, and Jitsuo Sugita, Ikeda, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Sep. 9, 1980, Ser. No. 185,965
Claims priority, application Japan, Sep. 21, 1979, 54-122423
Int. Cl.³ A01N *37/24*; C07C *103/22*
U.S. Cl. 71—103 24 Claims

1. $N^4$-Phenoxyalkanoylsulfanilamides of the formula:



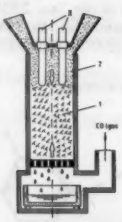
wherein $R^1$, $R^2$, $R^3$, and $R^4$ each independently represents hydrogen, halogen, nitro or lower alkyl, $R^5$ represents hydrogen or lower alkyl and $R^6$ represents hydrogen, lower alkoxycarbonyl, lower alkanoyl or carbamoyl, provided that when $R^1$, $R^3$, $R^4$, and $R^5$ are H and $R^2$ is H or Cl, $R^6$ is not acetyl or hydrogen, or alkali metal, alkaline earth metal or ammonium salts thereof.

24. A herbicidal composition containing an effective herbidical amount of at least one of the compounds defined in claim 1 and at least one inert diluent, carrier and/or adjuvant.

## 4,314,846
## METHOD FOR CARBOTHERMIC PRODUCTION OF ALUMINUM

Ketil Motzfeldt, Kjemi Lab. K, 7034 Tronheim-NTH, Norway

Filed Jul. 13, 1979, Ser. No. 57,308
Int. Cl.³ C22D *7/02*
U.S. Cl. 75—10 R 5 Claims



1. A method of producing aluminium and aluminum alloys by carbothermically reducing an oxide selected from the group consisting of alumina and alumina-containing oxide admixtures which comprises:

(a) supplying carbonaceous material and said oxide separately along mutually coverging paths and

(b) exposing said carbonaceous material and said oxide to a predetermined high temperature by supplying electrical heat energy to a reaction zone located at a position where said paths meet thereby to effect said carbonaceous reduction of said oxide, said carbonaceous material proceeding along its path to said reaction zone by an ascending movement adapted to the rate of consumption of said material in said zone and being supported in containers made of similar material, said containers being moved substantially vertically to be at least partially and progressively consumed along with said carbonaceous material on reducing said oxide in said zone.

## 4,314,847
## PROCESS FOR DEPHOSPHORIZATION AND DENITRIFICATION OF CHROMIUM-CONTAINING IRON

Shigeaki Maruhashi; Morihiro Hasegawa, and Takashi Yamauchi, all of Yamaguchi, Japan, assignors to Nisshin Steel Company, Ltd., Tokyo, Japan

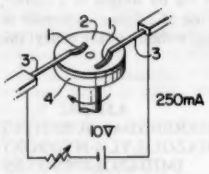
Filed Jun. 23, 1980, Ser. No. 161,815
Int. Cl.³ C21C *7/02*
U.S. Cl. 75—51 15 Claims

1. A process for dephosphorization-denitrification of molten pig iron containing not less than 3% Cr, comprising maintaining the C concentration of said molten pig iron at not less than 2% by weight, contacting said pig iron with a slag comprising more than 30% to 70% by weight of at least one selected from fluorides and chlorides of alkaline earth metals, 1.5 to less than 30% by weight of at least one of oxides, hydroxides and carbonates of sodium and potassium, 5–50% by weight of at least one of oxides of iron and nickel and from 0% to less than 40% by weight of at least one of oxides and carbonates of alkaline earth metals, while controlling oxidation of Cr.

## 4,314,848
## SILVER ALLOY FOR A SLIDING CONTACT

Tsunehiko Todoroki, Yamatokooriyama, and Hyogo Hirohata, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 19, 1979, Ser. No. 95,791
Claims priority, application Japan, Nov. 17, 1978, 53-142674
Int. Cl.³ C22C *5/08*
U.S. Cl. 75—173 C 4 Claims




1. Silver alloy for sliding contact, containing 2% to 8% molybdenum, 3% to 10% copper, up to 10% palladium and remainder silver.

## 4,314,849
## MAXIMIZING THE CORROSION RESISTANCE OF TIN CONTAINING STAINLESS STEEL POWDER COMPACTS

David H. Ro, Cleveland Heights; Erhard Klar, Beachwood, and C. I. Whitman, Bay Village, all of Ohio, assignors to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 10,956, Feb. 9, 1979, Pat. No. 4,241,831. This application Jan. 21, 1980, Ser. No. 113,584
Int. Cl.³ B22F *3/00*; C22C *33/02, 38/02*
U.S. Cl. 75—228 13 Claims

1. A process for maximizing the corrosion resistance of a low carbon stainless steel powder compact containing at least about 0.5% silicon and a predetermined amount of tin of at least about 0.01% which comprises, sintering said compact at a temperature not substantially below about 2300° F. at a dew point of at least about −60° F. for a time sufficient for establishing a tin:silicon ratio on the surface of said compact of at least about 1:1, while substantially preserving the microstructure of the powder contained therein, said time being at least ½ hour.

9. An irregularly-shaped, low-carbon, corrosion-resistant stainless steel powder atomized in an oxidizing atmosphere containing at least about 0.01% tin, at least about 0.5% silicon, about 0.6–1.0% oxygen, and up to about 3% copper.

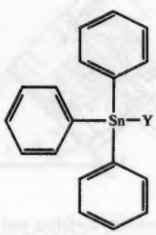
## 4,314,850
## ANTIFOULING COATING COMPOSITION

Takashi Watanabe; Katsushi Yamano; Kunio Yamamoto, and Shigeo Inomata, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Continuation of Ser. No. 953,252, Oct. 20, 1978, abandoned. This application Feb. 6, 1980, Ser. No. 119,146
Claims priority, application Japan, Oct. 26, 1977, 52/128528
Int. Cl.³ C09D 5/14
U.S. Cl. 106—15.05 14 Claims

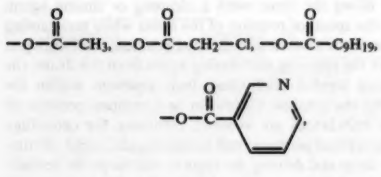
1. An antifouling coating composition comprising

(A) an antifouling agent composed of (i) 10 parts by weight of a triphenyltin compound of the formula



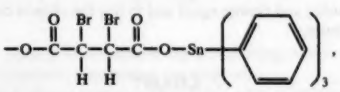

(I)

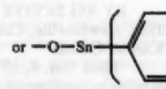
wherein Y represents —OH, halogen,










and (ii) 10 to 60 parts by weight of cuprous oxide and/or cuprous thiocyanate,

(B) a resinous vehicle composed of a resin having an acid value of not more than 10 as a main ingredient, and

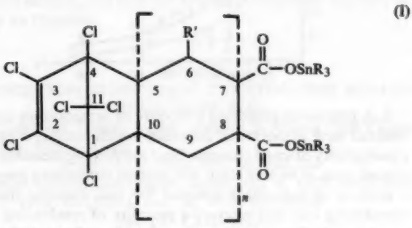
(C) an organic solvent, said resinous vehicle being present in an amount of 6 to 9 parts by weight per 10 parts by weight of the triphenyltin compound, said antifouling agent amounting to 37 to 75% by weight based on the weight of the coating composition, and said composition having a pigment volume concentration of 50 to 80% by volume.

## 4,314,851
## ANTIFOULING COATING COMPOSITIONS

Togrul N. ogly Shakhtakhtinsky, ulitsa 28 Aprelya, 11. kv. 38, Baku; Zakir M. ogly Rzaev, 1 mikroraion, 1ᵇ/6, kv. 8, Sumgait; Svetlana G. kyzy Mamedova, ulitsa Avakiana, 45, kv. 22, Baku; Akhmed D. ogly Dunyamaliev, 13 mikroraion. 42, kv. 39, Sumgait; Mustafa S. ogly Salakhov, 1 kvartal, 24A, kv. 66, Sumgait, and Mustafa M. ogly Guseinov, prospekt Narimanova, kvartal 522, G, kv. 30, Baku, all of U.S.S.R.

Division of Ser. No. 11,039, Feb. 9, 1979, Pat. No. 4,261,914.
This application Aug. 21, 1980, Ser. No. 179,977
Int. Cl.³ C09D 5/14
U.S. Cl. 106—16 6 Claims

1. In an antifouling coating composition comprising an antifouling agent, a polymeric binder, a filler, a pigment, and a solvent, the improvement comprising as the antifouling agent, a bis-trialkylstannyl derivative of chlorinated polycyclic dicarboxylic acids, having the general formula (I)



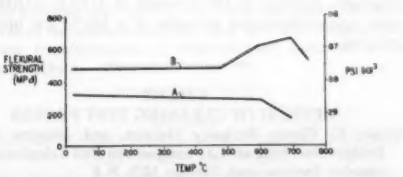

(I)

where R is a lower alkyl, R' is H or $CH_3$, and n is 0 or 1.

## 4,314,852
## SILICON CARBIDE FIBER REINFORCED GLASS COMPOSITES

John J. Brennan, Portland, and Karl M. Prewo, Vernon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 7, 1980, Ser. No. 147,672
Int. Cl.³ C04B 35/56; C03C 3/04, 3/08
U.S. Cl. 501—88 10 Claims

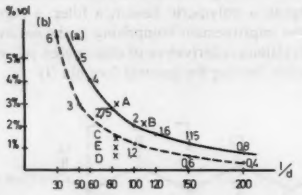



1. A silicon carbide fiber reinforced glass composite consisting essentially of about 30% to about 70% by volume silicon carbide fibers in a glass matrix selected from the group consisting of borosilicate glass, high silica content glass, aluminosilicate glass and mixtures thereof, the composite having a fracture toughness exemplified by a critical stress intensity factor above about 15,000 psi (inch)$^{\frac{1}{2}}$.

## 4,314,853
## PROCESS OF MIXING REINFORCING ELEMENTS WITH CASTABLE MATERIAL

Joris Moens, Kortrij, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium

Division of Ser. No. 850,246, Nov. 10, 1977, Pat. No. 4,224,377, which is a division of Ser. No. 456,592, Apr. 1, 1974, abandoned.
This application Jan. 18, 1980, Ser. No. 113,303
Claims priority, application United Kingdom, Apr. 16, 1973, 18322/73
Int. Cl.³ C04B 7/02
U.S. Cl. 106—99 12 Claims




1. A process of preparing a mixture of cementitious castable material such as mortar or concrete, which mixture comprises a multiplicity of small elongate fiber reinforcing elements made of steel, iron or an iron alloy, the process comprising preparing a mixture of ingredient material for said castable material, introducing into said mixture a plurality of reinforcing members being in the form of groups of said reinforcing elements, having a thickness between about 0.1 and 1 mm and a length-to-thickness ratio between about 50 and 200, bound together in a group by a binder affectable by a disintegration ingredient, then mixing said mixture, causing thereby said reinforcing members to be substantially uniformly distributed therein, and further mixing said mixture, causing thereby said reinforcing members to be disintegrated by means of said disintegration ingredient into separate elements, which are further substantially uniformly distributed in the mixture.

## 4,314,854
## METHOD FOR THE TREATMENT OF CELLULOSIC SUBSTANCES WITH HYDROGEN PEROXIDE

Motoyoshi Takagi, Toda, Japan, assignor to Bio Research Center Company Ltd., Saitama, Japan

Filed Mar. 5, 1981, Ser. No. 240,713
Claims priority, application Japan, Oct. 3, 1980, 55-30109
Int. Cl.³ C13K 1/02
U.S. Cl. 127—37 4 Claims

1. A method for treating cellulosic materials to be enzymatically converted to sugars which comprises contacting an aqueous suspension of the material with 0.1 to 10 weight percent of hydrogen peroxide in the presence of 1/10 to 1/1000 mole ratio against hydrogen peroxide of a $Mn^{+2}$ ion producing material.

## 4,314,855
## METHOD OF CLEANING TEST PROBES

Chuan C. Chang, Berkeley Heights, and Jitendra Kumar, Bridgewater, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

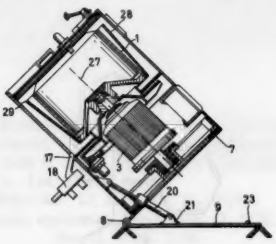
Filed Dec. 17, 1979, Ser. No. 104,379
Int. Cl.³ B08B 3/08, 3/10
U.S. Cl. 134—3 5 Claims

1. In a method of removing contaminants from electrically conductive test probes that are utilized to contact aluminum pad regions on an integrated circuit chip, the improvement comprising the step of cleaning said probes after multiple such contacts by immersing the probes in boiling water to remove contaminants accumulated during contacting of said aluminum pad regions.

## 4,314,856
## PROCESS FOR SEQUENTIALLY DEGREASING, TUMBLING, WASHING AND DRYING OBJECTS

Richard Steimel, Frankfurt Strasse 134, 5202 Hennef, Sieg, Fed. Rep. of Germany

PCT No. PCT/DE78/00030, § 371 Date Jun. 29, 1979, § 102(e) Date Jun. 25, 1979, PCT Pub. No. WO79/00244, PCT Pub. Date May 3, 1979
PCT Filed Oct. 27, 1978, Ser. No. 114,091
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1977, 2748615
Int. Cl.³ B08B 7/04
U.S. Cl. 134—25.4 3 Claims




1. A process of degreasing, tumbling and washing of industrially manufactured objects, comprising the following steps performed in order providing a centrifuge drum having a vertical axis of rotation; arranging the drum in a vertical position; filling the drum with the objects to be treated; rotating the centrifuge drum about said vertical axis of rotation so that the objects are degreased and oil is removed therefrom; braking the centrifuge drum down and tilting the same into an inclined position; rotating the drum in said inclined position at reduced speed so that the objects contained in the drum are tumbling in said drum filling the drum with a cleaning or rinsing agent; increasing the speed of rotation of the drum while maintaining the rotation of the same in said inclined position; discharging at least in part the cleaning and rinsing agent from the drum, the objects being treated readjusting their positions within the drum during the rotation thereof in said inclined position so that larger imbalances are avoided; returning the centrifuge drum to its vertical position; and increasing the speed of rotation of the drum and driving the same to discharge the remaining cleaning and rinsing agent and to dry the objects contained in the drum.

## 4,314,857
## METHOD OF MAKING INTEGRATED CMOS AND CTD BY SELECTIVE IMPLANTATION

Alan Aitken, Cowansville, Canada, assignor to Mitel Corporation, Kanata, Canada

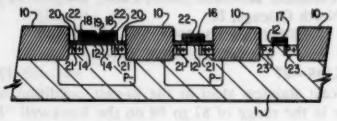
Filed Nov. 8, 1979, Ser. No. 92,609
Claims priority, application Canada, Jul. 31, 1979, 332884
Int. Cl.³ H01L 21/263, 7/54, 27/04
U.S. Cl. 148—1.5 13 Claims

1. A method of fabricating a semiconductor device comprising:

(a) providing a semiconductor substrate containing one impurity polarity type, having a silicon nitride mask over its upper surface for defining field effect device channel regions and charge transfer device storage regions, and a photoresist mask which is open over predetermined portions of the silicon nitride mask and the substrate surface for defining field effect device and charge transfer device

regions of similar polarity type, which is opposite to said one polarity type,

(b) applying a low dosage high energy implantation of opposite polarity type impurity into regions of the substrate not covered by the photoresist mask sufficient to form high



resistivity regions of the field effect and charge transfer devices, and using the same said masks

(c) applying a high dosage low energy implantation of said opposite type impurity into regions of the substrate not covered by both said masks sufficient to form low resistivity regions of the field effect and charge transfer devices.

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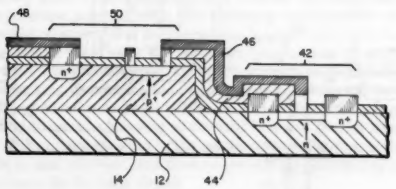
**4,314,858**

## METHOD OF MAKING A FULLY INTEGRATED MONOLITHIC OPTICAL RECEIVER

**Louis R. Tomasetta, and H. David Law, both of Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.**

**Filed Nov. 23, 1979, Ser. No. 96,872**
**Int. Cl.³ H01L *33/00, 27/14, 29/161***
**U.S. Cl. 148—1.5** **4 Claims**



1. A method of manufacturing a fully integrated monolithic optical receiver, comprising the steps of:

(a) providing a semi-insulating III-V alloy substrate having a major surface;

(b) fabricating an optical detector on the major surface by

(1) growing an epitaxial semiconducting layer of a first conductivity type III-V alloy over the major surface,

(2) selectively removing the epitaxial layer to leave a detector region defined by the remaining portion of the layer,

(3) selectively implanting a relatively heavily doped region of the first conductivity type in the epitaxial layer, and

(4) selectively implanting a relatively heavily doped region of a second conductivity type in the epitaxial layer and spaced from the implanted region of the first conductivity type;

(c) fabricating an electronic circuit on the major surface; and

(d) electrically coupling the detector to the circuit.

**4,314,859**

## PROCESS FOR DYEING ZINC AND ZINC ALLOYS

**Nobuyoshi Kasahara, Sayama, and Koutarou Nonomura, Kunitachi, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Nihonbashi, Japan**

**Continuation-in-part of Ser. No. 18,324, Mar. 7, 1979, Pat. No. 4,238,250. This application Nov. 5, 1980, Ser. No. 204,205**
**Claims priority, application Japan, May 4, 1978, 53/52807**
**The portion of the term of this patent subsequent to Dec. 9, 1997, has been disclaimed.**
**Int. Cl.³ C23F *7/26, 5/04***
**U.S. Cl. 148—6.1** **5 Claims**

1. A process for chemically coloring zinc or zinc alloy in multi-color, which comprises the steps of (1) dyeing with a dyestuff zinc or zinc alloy having a dyeable chromate film bonded thereonto, (2) polishing locally the dyed surface to expose the surface of zinc or zinc alloy, (3) making the chromate film on the exposed surface, (4) dyeing with same dyestuff in a different color density the chromate film on the exposed surface, and then the steps (2), (3) and (4) may successively be repeated.

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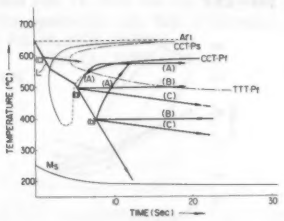
**4,314,860**

## METHOD FOR DIRECT HEAT TREATING HOT ROLLED STEEL WIRE ROD

**Jiro Tominaga, Hikari, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan**

**Filed Sep. 5, 1980, Ser. No. 184,324**
**Claims priority, application Japan, Sep. 6, 1979, 54-113562; Sep. 7, 1979, 54-114894; Sep. 10, 1979, 54-115938**
**Int. Cl.³ C21D *9/52***
**U.S. Cl. 148—12 B** **6 Claims**




1. Method for direct heat treating a hot rolled steel wire rod in direct sequence with the final finishing stand of a rod hot rolling mill which comprises a series of steps consisting of subjecting said rod to a controlled cooling at such a temperature as not below Ms at a cooling rate so as to form the sorbite structure in said rod by utilizing the retained heat of said rod as it emerges from the final stand of said hot rolling mill, reheating said rod to a temperature substantially equal to the nose temperature of TTT or time temperature transformation diagram of said rod, and holding said rod at said temperature for a period of sufficiently extended time to secure substantially complete transformation of untransformed austenite to the sorbite structure.

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**4,314,861**

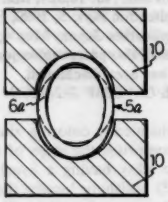
## MANUFACTURING METHOD OF ELBOWS MADE OF CAST STAINLESS STEEL

**Shinichi Murakami; Hisakatsu Nishihara; Arata Yoshimitsu, and Sueyoshi Noji, all of Hirakata, Japan, assignors to Kubota Ltd., Osaka, Japan**

**Filed Jun. 2, 1980, Ser. No. 155,187**
**Claims priority, application Japan, Jun. 5, 1979, 54-70843**
**Int. Cl.³ C22F *26/00***
**U.S. Cl. 148—12 E** **5 Claims**

1. A manufacturing method of elbows made of cast stainless steels comprising the steps of providing a cast stock tube made

of a cast austenitic stainless steel, with its chemical composition so adjusted as to have the ferrite phase mixed in the proportion of 5–40%, and with straight tube portions at its ends formed larger or smaller than a final dimension, subjecting said tube to




a process of contraction or expansion at said straight tube portions at its ends, thereby obtaining a tube formed roughly to said final dimension with its ends plastic deformed, and subjecting said tube with its ends plastic deformed to a heat treatment of heating at 1,000°–1,200° C. followed by quenching.

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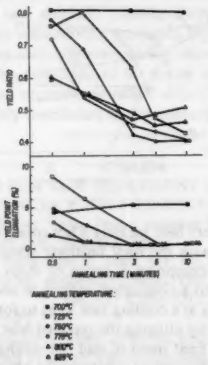
**4,314,862**

## DUAL PHASE HIGH STRENGTH COLD-ROLLED STEEL PLATE

**Masatoshi Sudo; Masanori Higashi, both of Kobe; Tsuguaki Ohki, Hyogo, and Shoji Kanbe, Kobe, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan**

**Filed Sep. 3, 1980, Ser. No. 183,711**
**Claims priority, application Japan, Oct. 16, 1979, 54-133689**
**Int. Cl.³ C22C *38/38, 38/32***
**U.S. Cl. 148—12 F** **8 Claims**




**1**. A dual phase high strength cold-rolled steel plate, characterized by the composition consisting essentially of 0.02–0.15% of C, 1.5–2.5% of Mn, less than 0.2% of Si, 0.2–1.5% of Cr, 0.044–0.15% of P, less than 0.06% of Al, less than 0.02% of S, and the balance of iron and unavoidable impurities, wherein said plate is annealable at 775° C. for less than one minute to give said dual phase and a yield point elongation of zero without skin pass rolling, a tensile strength of at least 45.7 kg/mm², and a yield ratio of no more than 0.58.

**5**. A dual phase high strength cold-rolled steel plate, characterized by the composition consisting essentially of 0.02–0.15% of C, 1.5–2.5% of Mn, less than 0.2% of Si, 0.2–1.5% of Cr, 0.044–0.15% of P, less than 0.06% of Al, less than 0.02% of S, 0.0005–0.01% of B, at least one member selected from the group consisting of 0.003–0.1% of Nb, 0.01–0.1% of Ti and 0.01–0.1% of Zr, and the balance of iron and unavoidable impurities, wherein said plate is annealable at 775° C. for less than one minute to give said dual phase and a yield point elongation of zero without skin pass rolling, a tensile strength of at least 45.7 kg/mm², and a yield ratio of no more than 0.58.

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**4,314,863**

## STAINLESS STEEL CASTINGS

**Jon McCormick, Thousand Oaks, Calif., assignor to Fansteel Inc., North Chicago, Ill.**

**Filed Oct. 31, 1979, Ser. No. 89,980**
**Int. Cl.³ C22C *38/42***
**U.S. Cl. 148—37** **17 Claims**

**1**. A cast stainless steel in the as-cast condition having a hardness in the range of 82 to 98 on the Rockwell "B" scale and a V-notch Charpy impact strength of at least about 30 ft.-lbs., and consisting essentially by weight of about 13–19% Cr, 2.0–3.6% Ni and 2.0–3.5% Cu with Ni plus Cu at least 5.0%, 0.2–1.4% Mn, 0.5–1.0% Si, 0.035% max P, 0.035% max. S, 0.1% max. Mo, 0.1% max. Cb, 0.1% max. Al, 0.20–0.80% C when N is about 0.05% max. and 0.10–0.60% C when N is 0.05–0.10%, with the balance essentially Fe and any conventional impurities.

**11**. A cast stainless steel golf club head in the as-cast condition having a hardness in the range of 82 to 98 on the Rockwell "B" scale and consisting essentially by weight of about 13–20% Cr, 2.0–3.6% Ni, and 2.0–3.5% Cu, with Ni plus Cu at least 5.0%, 0.2–1.4% Mn, 0.5–1.0% Si, 0.035% max. P, 0.035% max. S, 0.1% max. Mo, 0.1% max. Cb, 0.1% max. Al, 0.20–0.80% C when N is 0.05% max. and 0.10–0.60% C when N is 0.05–0.10%, with the balance essentially Fe and any conventional impurities.

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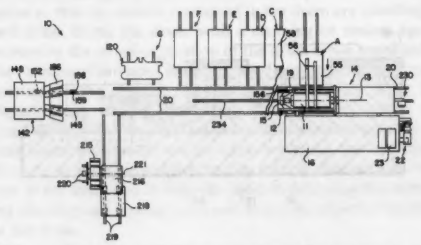
**4,314,864**

## METHOD AND APPARATUS FOR BUILDING A TIRE

**Earl F. Loeffler, Uniontown, and Harley P. Weyand, Jr., Doylestown, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio**

**Filed May 7, 1980, Ser. No. 147,668**
**Int. Cl.³ B29H *17/16***
**U.S. Cl. 156—111** **17 Claims**



**14**. A method for building a vehicular tire on a tire assembly drum which is rotatably supported by a headstock comprising the steps of:

providing a first movable carriage carrying a tire assembly drum;

supporting the outboard end of the rotatable tire assembly drum by a drum support;

providing a tailstock on a second movable carriage;

grossly moving said first carriage to a successive plurality of operation stations;

precisely orienting said first carriage at each successive operation station;

sequentially applying tire components to the tire assembly drum at successive operation stations;

moving said drum support to a passive position;

moving said second carriage and tailstock onto said first carriage to engage the outboard end of said tire assembly drum rotatably with the tailstock;

toroidally shaping the components on said tire assembly drum against a tread assembly held by said tailstock.

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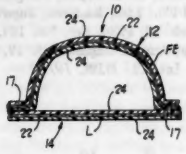
4,314,865

## METHOD OF MAKING CUSHIONING DUNNAGE

Gary W. Ottaviano, Bedford Heights, Ohio, assignor to Ranpak Corp., Willoughby, Ohio

Filed Sep. 14, 1979, Ser. No. 75,662
Int. Cl.³ B32B 3/28, 31/00
U.S. Cl. 156—145 23 Claims



1. In a method of manufacturing air cell cushioning dunnage material from flexible plastic sheet, with each of the sheets comprising a composite of an intermediate stratum of high density thermoplastic material generally impervious to the passage of gas therethrough and exterior stratums bonded to the intermediate stratum with the exterior stratums being formed of low density low melting point thermoplastic, with said intermediate stratum being of a high density, higher melting point material as compared to that of the exterior stratums, comprising the steps of heating a first of the composite sheets to a temperature above the melting point temperature of the exterior stratums but below the melting point temperature of the intermediate stratum, embossing said heated first sheet by feeding it onto a rotating forming drum having a plurality of recesses therein and forming the air cells in the recesses on said forming drum by vacuum, heating a second composite sheet of the plastic above the melting point of the exterior stratums of said second sheet, cooling by means of said drum the embossed sheet while on said rotating drum to a temperaure below said melting point temperature of said exterior stratums and to a temperature approaching the softening temperature of the exterior stratums, and then applying said second sheet to said first cooled sheet after the latter has been cooled to said temperature approaching said softening temperature whereby the residue heat in said second sheet causes a melting of the confronting exterior stratum of the cooled embossed sheet sufficiently to cause a bonding of the said first and second sheets at the areas of engagement while on the drum so as to seal the air cells in said product, and then removing the cushioning product from the forming drum.

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4,314,866

## METHOD FOR ELEVATED-TEMPERATURE BONDING OF MATERIAL WITH DIFFERENT COEFFICIENTS OF THERMAL EXPANSION

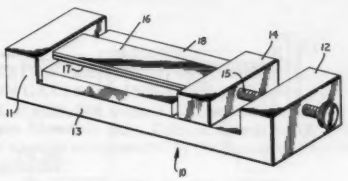
Robert C. Webber, Marietta, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Dec. 9, 1980, Ser. No. 214,477
Int. Cl.³ B32B 7/12
U.S. Cl. 156—163 8 Claims

1. A method for reducing post-adhesive-cured warping or deformation of thermal cured adhesive bonded adherends having different coefficients of thermal expansion comprising the steps of:

(a) stacking the adherends in a clamping means with a thermal curing adhesive in an uncured state between each adjacent pair of adherends;

(b) compressing one pair of opposite side edges of the adherends by closure of the clamping means by an amount substantially equal to the amount of thermal expansion the clamping means will experience between the clamping means members compressing the adherends by the temperature differential between the clamping temperature and the adhesive cure temperature so that the dimension between the opposite side edges of the adherends at the adhesive cure temperature will be substantially the same dimension as at the clamping temperature;



(c) elevating the temperature of the clamping means, the adherends and the adhesive to at least the cure temperature of the adhesive; and

(d) after cure of the adhesive, removing the adherends from the clamping means.

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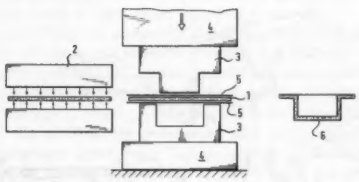
4,314,867

## METHOD FOR THE MANUFACTURE OF MOLDED BODIES

Fritz Berger, Ottobeuren; Udo Lauterbach, Augsburg, and Hermann Wetzel, Memmingen, all of Fed. Rep. of Germany, assignors to Metzeler Schaum GmbH, Memmingen, Fed. Rep. of Germany

Filed Oct. 12, 1979, Ser. No. 84,516
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1978, 2844757; Jul. 24, 1979, 2929992
Int. Cl.³ B29B 3/00
U.S. Cl. 156—196 7 Claims



1. Method for the manufacture of molded bodies, which comprises heating a plate of thermo-plastic hard polyurethane foam, placing a reinforcing cover layer of UP-Prepreg or sheet molding compound on at least one side of the plate, and changing the form of the heated body under pressure to a different given shape during the hardening of the polyester in the cover layer.

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4,314,868

## METHOD AND APPARATUS FOR PREVENTING WARP IN CORRUGATED CARDBOARD

Tadeshi Hirakawa; Tochiaki Kusubayashi, and Yukio Oku, all of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Aug. 8, 1979, Ser. No. 64,830
Claims priority, application Japan, Aug. 10, 1978, 53/97712
Int. Cl.³ B31F 1/20; B32B 3/28
U.S. Cl. 156—207 9 Claims

1. A method for treating corrugated board comprising:

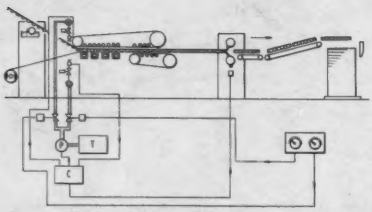
(a) moving an upper liner, a lower liner, and an intermediate corrugated sheet toward a cutting zone;

(b) securing said upper liner, said intermediate sheet, and said lower liner, together with said intermediate sheet

sandwiched between said upper and lower liners to form a corrugated board prior to movement through said cutting zone;

(c) cutting said corrugated board into sections in said cutting zone;

(d) stacking successive cut sections of corrugated board on preceding cut sections of corrugated board in a stack after said cutting step;



(e) imparting different curvature to said sections prior to said stacking steps; and

(f) said imparting step being controlled for imparting curvature on successive sections substantially opposite to curvature on preceding sections to permit the weight of said stack to correct said formed different curvature and render said corrugated board substantially flat.

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**4,314,869**

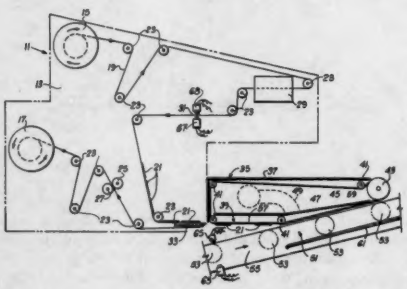
## WINE BOTTLE LABELER

**Michael Crankshaw, Santa Fe Springs, Calif., assignor to Label-Aire, Fullerton, Calif.**

**Filed Dec. 24, 1980, Ser. No. 218,600**

**Int. Cl.³ B65C *3/16, 9/34***

**U.S. Cl. 156—215** **7 Claims**



1. A method of applying a plurality of labels to a label-receiving surface of an article, said method comprising:

conveying articles to be labeled through a label applying station with each of the articles having a label-receiving surface;

providing labels with each of the labels having an adhesive face and an information-carrying face adapted to have information thereon;

dispensing first and second of the labels onto a vacuum belt transport means with the adhesive faces of the first and second labels facing outwardly;

transporting the first and second labels to the label applying station with the vacuum belt transport means; and

contacting a first of the articles at the labeling station with the adhesive face of the first label on the vacuum belt transport means to adhere the first label to a first location on the label-receiving face of the first article, rotating the first article and contacting the label-receiving surface of the first article with the adhesive face of the second label on the vacuum belt transport means to adhere the second label to a second location on the label-receiving surface of the first article whereby the first and second labels are applied to different locations on the label-receiving surface of the first article.

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**4,314,870**

## METHOD OF MOUNTING ELECTRONIC COMPONENTS

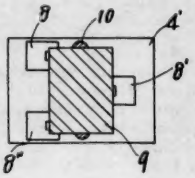
**Toshimichi Ishida, Kadoma; Takeo Takayanagi, Nara, and Yasuo Taki, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan**

**Filed Feb. 13, 1980, Ser. No. 121,145**

**Claims priority, application Japan, Feb. 19, 1979, 54-18144**

**Int. Cl.³ B29C *19/02***

**U.S. Cl. 156—272** **4 Claims**




1. A method of mounting an electronic component of leadless type onto a printed circuit board comprising the steps of applying adhesive to the board at least at two locations and between connection lands provided on the board, said two locations being spaced by a distance not less than but substantially equal to the width of the electronic component, placing the electronic component on the adhesive to retain it in position with its bottom surface and part of its side surfaces in contact with the adhesive, and curing the adhesive by ultraviolet rays or heat, thereby temporarily holding the electronic component on the board before soldering it thereto.

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**4,314,871**

## METHOD OF AND APPARATUS FOR LAMINATING TIMBER

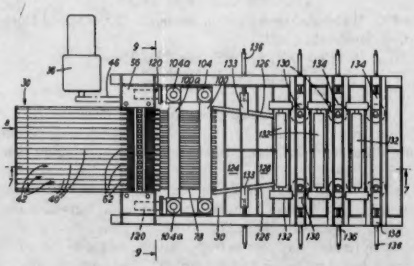
**Harry Weinstock, 302 La Contell, 50 Mitchell St., Berea, Johannesburg, 2198, South Africa, and Harry L. Bregman, Johannesburg, South Africa, assignors to Harry Weinstock, Johannesburg, South Africa**

**Filed Oct. 23, 1979, Ser. No. 87,561**

**Claims priority, application South Africa, Apr. 23, 1979, 79/1914**

**Int. Cl.³ B27G *11/00*; B32B *31/12, 31/20***

**U.S. Cl. 156—258** **11 Claims**



1. A method of forming a beam from a plurality of short

lengths of timber having pairs of opposite elongated side faces and smaller end faces; the method comprising:

(a) arranging the timber lengths in a number of rows with one pair of the said side faces vertical;

(b) feeding the rows of timber lengths to a bonding medium application station;

(c) spraying bonding medium onto the said vertical side faces of the timber lengths in such a manner that the bonding medium is also applied to the end faces of the timber lengths;

(d) forcing the end faces of the timber lengths in each row into engagement with one another so as to allow these faces to bond together thereby forming elongated timber strips from the timber lengths in the rows respectively;

(e) causing the timber strips to move together through pressure means, and

(f) maintaining the strips between the said pressure means for a period of time to facilitate the bonding together of the contiguous side faces of the timber strips.

7. Apparatus for forming a timber beam from a number of short lengths of timber having opposite elongated side faces and smaller end faces, the apparatus comprising;

(a) guide path means guiding the timber lengths in rows with one pair of side faces vertical,

(b) spray means for currently spraying bonding medium to said vertical side faces and end faces of each timber length, and

(c) pressure rollers rotatable around vertical axes which pressure rollers

(i) receive the strips from the guide means

(ii) cause the timber strips to move together, and

(iii) apply pressure to the strips and hold them under pressure to facilitate bonding together of said side and end faces.

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**4,314,872**

## APPARATUS FOR EQUIPPING PROFILES FORMED OF ELASTIC MASSES WITH VELOUR BANDS

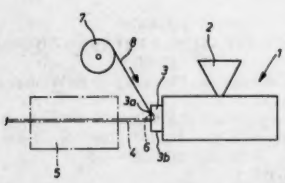
**Walter H. Schiesser, Zrich, Switzerland, assignor to Schiesser AG, Switzerland**

**Filed Jun. 18, 1980, Ser. No. 160,594**

**Claims priority, application Switzerland, Mar. 26, 1980, 2382/80**

**Int. Cl.³ B29B *3/00***

**U.S. Cl. 156—500** **8 Claims**




1. An apparatus for providing profiles formed of elastic masses with velour bands, said apparatus comprising:

a guide element for guiding a velour band;

means for forming a profile of a particular shape, said profile-forming means including means for heating the profile; said profile-forming means including an injection disc for forming and shaping the profile, and said guide element comprising an element mounted upon said injection disc;

said guide element cooperating with said profile-forming means to define a path for feeding a velour band to cause the velour band to come into contact with a formed profile passing through said profile-forming means after the profile has been heated by said profile-forming means and while the profile is still in a heated condition; said path including throughpass means for passage of the combination of the profile and the velour band; and

said throughpass means including a portion which is constricted in such a manner as to press a carrier band of the velour band into an outer layer of the profile which is still in a heated condition.

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**4,314,873**

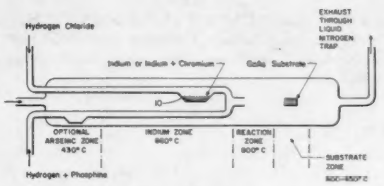
## METHOD FOR DEPOSITING HETEROEPITAXIALLY INP ON GAAS SEMI-INSULATING SUBSTRATES

**Herman H. Wieder, San Diego, Calif., and Charles R. Parkerson, Green Mountain Falls, Colo., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jul. 5, 1977, Ser. No. 812,965**

**Int. Cl.³ C30B *25/02***

**U.S. Cl. 156—610** **5 Claims**




1. A method of lattice matching two different binary alloys having different lattice constants, comprising the steps of

(a) selecting a first binary alloy of the form AB, said first binary alloy being InP,

(b) selecting a second binary alloy of the form CD, said second binary alloy being GaAs,

(c) depositing said first binary alloy upon said second binary alloy using a vapor heteroepitaxial process,

(d) controlling the composition and the velocity of the constituent gases and reaction products and the temperature of the source and substrate zones of said process to form a compositional graded intermediate quaternary layer of the form $A_yC_{1-y}B_xD_{1-x}$ where x and y are atomic fractions of the constituents in between said binary alloys, said quaternary layer being $In_yGa_{1-y}As_xP_{1-x}$, wherein the indium source zone is held at 860° C. and the substrate zone is heated to a temperature in the range of 600° to 650° C. and controlled to ±1° C. and the constituent gases and products are transported at a velocity in the range of 14 to 48 cm/min.

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**4,314,874**

## METHOD FOR FORMING A FINE PATTERN OF AN ALUMINUM FILM

**Haruhiko Abe; Yoji Mashiko, both of Itami; Hiroshi Harada, Kawanishi; Sotoju Asai; Kazuo Mizuguchi, both of Amagasaki, and Sumio Nomoto, Itami, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 24, 1980, Ser. No. 190,286**

**Claims priority, application Japan, Oct. 9, 1979, 54/130391**

**Int. Cl.³ C23F *1/02***

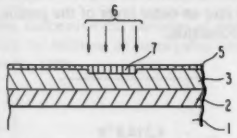
**U.S. Cl. 156—628** **6 Claims**

1. A method for forming a fine pattern of an aluminum film, comprising the following steps:

(a) coating a surface of a substrate with an aluminum film,

(b) selectively irradiating said aluminum film with an oxygen ion beam to form an oxygen ion implanted region, and

(c) plasma etching said aluminum film using said implanted region as a mask, whereby unimplanted areas of the alumi-




num film are removed while areas thereof underlying the implanted region are left substantially intact.

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**4,314,875**

## DEVICE FABRICATION BY PLASMA ETCHING

**Daniel L. Flamm, Chatham Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed May 13, 1980, Ser. No. 149,470**
**Int. Cl.³ H01L *21/306***
**U.S. Cl. 156—643** **10 Claims**

1. Process for fabrication of an article comprising at least one operation during which the article undergoing fabrication comprises a surface of material to be etched wherein the said article is etched within a plasma environment contained within an apparatus, the plasma resulting from imposition of an electrical field across gaseous reactant between two electrodes, etching being primarily due to chemical reaction with the said material to be etched, the said gaseous reactant including an effective etchant precursor for yielding a plasma-derived effective etchant primarily responsible for the said chemical reaction and an unsaturate precursor which yields ethylenically unsaturated material or radical which may yield unsaturated material here designated as "unsaturate" which may combine with effective etchant to reduce the amount of available effective etchant, characterized in that the said gaseous reactant includes an oxidant precursor which yields an additional oxidant which combines with unsaturate to result in reduced reaction between unsaturate and effective etchant and thereby increase concentration of effective etchant whereby the rate of the said chemical reaction is increased.

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**4,314,876**

## TITANIUM ETCHING SOLUTION

**Lawrence N. Kremer, Trenton, and Matthew A. Boehmer, Allen Park, both of Mich., assignors to The Diversey Corporation, Mississauga, Canada**

**Filed Mar. 17, 1980, Ser. No. 130,938**
**Int. Cl.³ C23F *1/00***
**U.S. Cl. 156—664** **7 Claims**

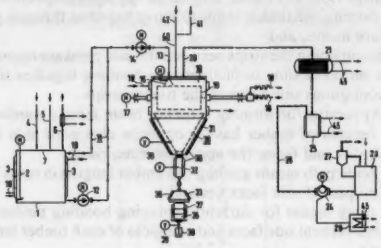
1. A method for chemically milling a metal comprising subjecting the metal to the action of a solution consisting essentially of 3 to 10 percent by weight of ammonium bifluoride, a nitrate source selected from the group consisting of nitric acid, ammonium nitrate, sodium nitrate and potassium nitrate in amount equivalent to 5 to 15 percent by weight of nitric acid, 2 to 25 percent by weight hydrochloric acid where the nitrate source is ammonium nitrate, sodium nitrate or potassium nitrate, 0 to 1 percent by weight of a wetting agent and 92 to 49 percent by weight water.

**4,314,877**

## METHOD AND APPARATUS FOR DRYING RADIOACTIVE WASTE WATER CONCENTRATES FROM EVAPORATORS

**Horst Queiser, Maintal; Othmar Meichsner, Raunheim, and Dietmark Erbse, Rodenbach, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany**

**Filed Oct. 28, 1980, Ser. No. 201,561**
**Claims priority, application Fed. Rep. of Germany, Nov. 2, 1979, 2944302**
**Int. Cl.³ B01D *1/24***
**U.S. Cl. 159—47 WL** **20 Claims**



1. Method for drying radioactive waste water concentrates from evaporators which comprises

(a) preheating a waste water concentrate with a solids content of at most 20% by weight to a temperature of 50°–70° C.,

(b) passing the preheated concentrate with a solids content of at most 20% by weight into a two-cylinder drier at the rate of 10 to 20 liters per square meter of usable cylinder surface per hour,

(c) maintaining the cylinder temperature between about 160° to 210° C.,

(d) retaining the concentrate in the drier for a residence time of 7 to 18 seconds on the cylinder to produce a dried product of low residual moisture on the cylinder surface, and

(e) discharging the dried product of low residual moisture from the cylinder surface.

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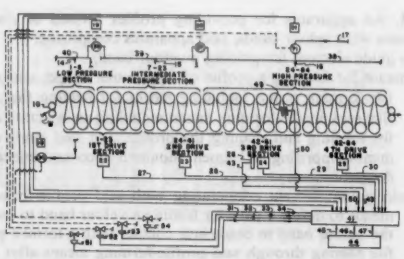
**4,314,878**

## METHOD OF OPERATING A PAPERMACHINE DRYING LINE

**Hong H. Lee, Gainesville, Fla., assignor to Westvaco Corporation, New York, N.Y.**

**Continuation of Ser. No. 872,379, Jan. 26, 1978, abandoned. This application May 14, 1979, Ser. No. 38,406**
**Int. Cl.³ D21F *5/04, 5/06***
**U.S. Cl. 162—198** **4 Claims**



1. A method of operating a papermachine having an evapo-

rative web drying line including a plurality of heating fluid temperature sections comprising the steps of:

A. Deriving a functional relationship between a reasonable drainage rate range for a type of pulp stock laid on said papermachine to form a given basis weight web and the approximate lowest critical moisture content obtainable in said web at the substantially earliest position along said drying line;

B. Measuring the drainage rate of a particular flow increment of stock to said papermachine being of said type;

C. Determining from said drainage rate measurement and said functional relationship, a first physical representation of said lowest critical moisture content and a second physical representation corresponding to the point of earliest occurrence thereof along said drying line;

D. Forming a web on said papermachine of said basis weight from said stock flow increment;

E. Deriving from said first and second physical representations, heating fluid temperature set-point values respective to said plurality of sections thus forming a drying rate trajectory;

F. Responsive to said temperature set-point values, controlling the flow rate and temperature of heating fluid in said plurality of sections to maintain said respective set-point values; and

G. Operating said papermachine to dry said web within said plurality of sections according to an approximate drying rate trajectory including said lowest critical moisture content at said point of earliest occurrence.

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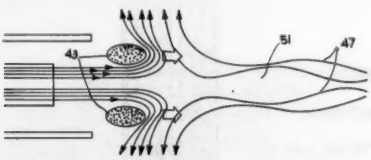
## 4,314,879

## PRODUCTION OF FIELD-REVERSED MIRROR PLASMA WITH A COAXIAL PLASMA GUN

**Charles W. Hartman, Alamo, and James W. Shearer, Livermore, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Mar. 22, 1979, Ser. No. 22,894**
**Int. Cl.³ G21B *1/00***
**U.S. Cl. 376—128** **11 Claims**




1. A method of producing a field-reversed mirror plasma, comprising the steps of:

producing a minimum B magnetic field of multi-Tesla strength in an evacuated plasma confinement apparatus by means of a magnetic mirror;

generating a plasma ring by means of a coaxial plasma gun, said coaxial plasma gun possessing a solenoidal conductor configuration so as to produce a poloidal magnetic field, the inner component of said poloidal field being in a direction opposite to that of the magnetic field of the mirror so as to form a magnetic field-reversed configuration around the gun;

accelerating the plasma ring by means of said coaxial plasma gun so that the plasma ring drifts out of and away from the coaxial plasma gun in a direction parallel to the coaxial plasma gun's longitudinal axis and toward said magnetic mirror, thus forming a field-reversed plasma ring upon reconnection of the magnetic field lines between said plasma ring and said coaxial plasma gun; and

confining the field-reversed plasma ring in the minimum B magnetic well of the magnetic mirror thereby producing a field-reversed mirror plasma.

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## 4,314,880

## HYDROGEN PERMEATION RESISTANT BARRIER

**Joseph C. McGuire, and William F. Brehm, both of Richland, Wash., assignors to The United States Department of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Feb. 8, 1980, Ser. No. 119,740**
**Int. Cl.³ G21C *1/02, 3/20;* B05D *3/02***
**U.S. Cl. 376—146** **7 Claims**

7. A hydrogen diffusion resistant component for a liquid metal fast breeder reactor or a fusion reactor containing molten alkali metal as a coolant, in which said component is subjected to an environment of molten alkali metal and hydrogen, comprising:

a. a metal wall of an austenitic, ferritic, or nickel-rich alloy; and

b. a hydrogen permeation resistant intermetallic aluminide coating of $Fe_3Al$, FeAl, $Fe_3Al_2$, $Ni_3Al$, NiAl, or $AiAl_2$ formed by the diffusion of aluminum into a surface of said metal wall.

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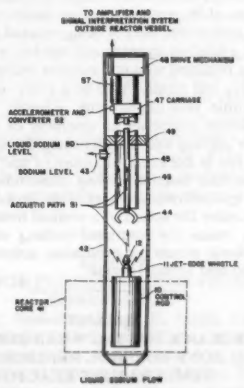
## 4,314,881

## REACTOR CONTROL ROD TIMING SYSTEM

**Peter T. K. Wu, Clifton Park, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Mar. 18, 1980, Ser. No. 131,303**
**Int. Cl.³ G21C *17/00***
**U.S. Cl. 376—245** **9 Claims**



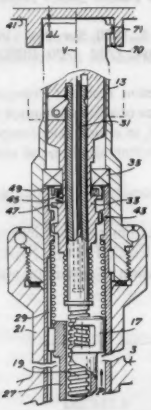

1. A real-time-timing measurement system for determining the time duration for a reactor control rod from release to down position, comprising: means for producing an acoustic signal upon a control rod reaching its down position, means for receiving and amplifying the acoustic signal, and means for comparing a time of the acoustic signal with a time of release of the control rod, said acoustic signal producing means including a fluid activated jet-edge whistle having an adjustable resonator cavity which is activated by a fluid pressure pulse produced upon an associated control rod reaching down position.

**4,314,882**

## DEVICE FOR ACTUATING A NUCLEAR REACTOR CONTROL ROD

**Claude Etienne, Aix en Provence; Claude Fardouet, Massy, and Guy Mercier L'Abbe, Aix en Provence, all of France, assignors to Commissariat a L'Energie Atomique, Paris, France**

**Filed Jul. 24, 1979, Ser. No. 60,226**
**Claims priority, application France, Jul. 27, 1978, 78 22253**
**Int. Cl.³ G21C *7/14***
**U.S. Cl. 376—235** **5 Claims**



1. A nuclear reactor control rod actuating device of the type comprising an assembly or so-called first assembly for carrying out a low-speed translational displacement and dropping of the control rod, said assembly being constituted by a leak-tight casing tube rigidly fixed to the closure head of the nuclear reactor pressure vessel and adapted to communicate with said pressure vessel, a screw and nut system coupled to the control rod by means of the nut and a screw-retaining device capable of releasing said screw, the nut being secured against rotational motion and guided in translational motion within a tube provided with a retaining stop at the lower end and engaged with a rotary drive rod rigidly fixed to a rotor which is rotatably mounted within said casing tube, wherein said control-rod actuating device comprises an assembly or so-called second assembly for limiting and then arresting the upward motion of the control rod in the event of failure of said leak-tight casing tube, said second assembly being constituted by means for limiting the upward displacement of the broken portion of said casing tube under the action of a vertical thrust resulting from said failure, means for rotational locking of said rotor and calibrated elastic means for producing action on the rotor in opposition to said vertical thrust.

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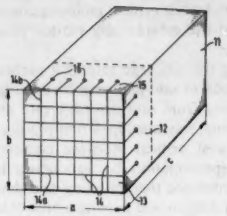
**4,314,883**

## GRAPHITE BLOCK HAVING WEAR ZONE AND LOAD BEARING ZONE FOR SIDE REFLECTOR OF HIGH TEMPERATURE REACTOR

**Rolf Fritz, Oftersheim; Josef Schoening, Hambruecken; Claus Elter, Bad Durkheim, and Walter Theymann, Viernheim, all of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH., Cologne, Fed. Rep. of Germany**

**Filed Oct. 18, 1979, Ser. No. 85,873**
**Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2851724; Jul. 26, 1979, 2930279**
**Int. Cl.³ G21C *5/08***
**U.S. Cl. 376—381** **19 Claims**

16. A gas-cooled high temperature pebble bed reactor comprising a reactor core arranged in a cavity in a prestressed pressure vessel, a side reflector of a plurality of graphite blocks arranged in a plurality of annuli about said reactor core and a cooling circuit for the reactor, each of said graphite blocks having a wear zone facing said reactor core and a load bearing zone separate from said wear zone, a plurality of straight line



slits in the frontal surface of said wear zone, and a first plurality of bores in said wear zone wherein each bore is located adjacent and contiguous with the terminus of one of said straight line slits each of said slits having a bore.

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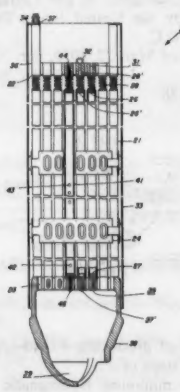
**4,314,884**

## NUCLEAR FUEL ASSEMBLY

**Alan W. Fanning; William G. Jameson, Jr., and Victor E. Hazel, all of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.**

**Filed May 21, 1979, Ser. No. 40,997**
**Int. Cl.³ G21C *3/30***
**U.S. Cl. 376—441** **10 Claims**



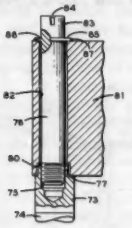
1. In a fuel assembly for use with a plurality of fuel assemblies and a neutron moderator fluid in a nuclear reactor core including a plurality of elongated fuel rods of predetermined outside diameter arranged in spaced array: at least one spacer positioned intermediate the ends of said fuel rods forming a plurality of cells for passage of said fuel rods therethrough; a spring member extending into each of the cells occupied by a fuel rod and engaging the fuel rod therein for lateral support thereof; at least one hollow tube positioned in an inner position of said assembly and passing through a cell of said spacer, said hollow tube being formed with means for entrance and egress of moderator fluid, said hollow tube having an outside diameter greater than the outside diameter of said fuel rods; and a W-shaped spring member extending into the cell of said spacer occupied by said hollow tube and providing two points of contact therewith for lateral support thereof.

4,314,885

## INDUSTRIAL TECHNIQUE

Gerald T. Edwards, and Donald C. Schluderberg, both of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Oct. 18, 1978, Ser. No. 952,523
Int. Cl.[3] G21C 7/10
U.S. Cl. 376—327 2 Claims




1. A control component structure comprising a spider having a plurality of arms, each arm having a bore formed therein for receiving a burnable poison rod,

a burnable poison rod having a longitudinal axis and including

a stem protruding from and affixed to an end of the burnable poison rod and in longitudinal alignment with the rod, the stem being nested within the spider bore,

a flange affixed to and protruding traversely from the stem for providing a retaining force, the flange extending beyond the diameter of the spider bore for retaining the stem within the bore, and a groove formed in the flange, circumferentially around the stem, in longitudinal alignment with the spider bore in order to provide a predetermined weak point, said flange being adapted to break at the groove by movement of the rod and the stem in a longitudinal direction with respect to the spider bore through the application of a force to the stem greater than and opposing the retaining force while maintaining structural unity of the poison rod and maintaining structural unity of the spider.

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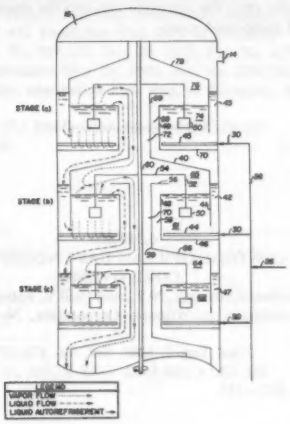
4,314,886

## MECHANICALLY AGITATED LIQUID-VAPOR CONTACTING APPARATUS

Douglas G. Ryan, Rockaway, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 974,071, Dec. 28, 1978, abandoned. This application Jun. 11, 1980, Ser. No. 158,374
Int. Cl.[3] C10G 73/10; B01D 11/04
U.S. Cl. 196—14.5 4 Claims

1. An apparatus comprising a vertical, elongated tower having a feed inlet at the top and liquid and vapor outlets in a lower section, said apparatus containing a plurality of vertically spaced, horizontally disposed stages therein, means for mechanically agitating a liquid or vapor introduced into each of said stages with liquid present in said stages by means of agitator means mounted to a single shaft driven by a single driver means, and means for separating said stages one from the other while defining fluid communication channels between said stages, said stages comprising (a) liquid tray means horizontally attached to the interior walls of the elongated, vertical tower; (b) weir means attached vertically to the liquid tray means along the interior perimeter of the tray means at some distance from the interior walls of the tower thereby defining (1) a liquid-vapor stage comprising a liquid space and a vapor space over said liquid space, which maintains a predetermined amount of liquid on said liquid tray means in said liquid space between the weir and the tower wall and (2) a fluid communication channel; (c) a first liquid downcomer means communicating with said stage separation means to define a liquid communication channel in the fluid communication channel leading from the liquid space of the liquid-vapor stage immediately above the recited liquid-vapor stage to the recited liquid-vapor stage; (d) a second liquid downcomer means defining a second liquid communication channel leading from the liquid space of the recited liquid-vapor stage to the liquid space of a liquid stage immediately below the recited liquid-vapor stage; (e) a first vapor communication channel in the fluid communication channel defined by said first liquid downcomer means leading from the vapor space immediately above the liquid space of the liquid-vapor stage immediately above the recited liquid-vapor stage to the vapor space immediately above the recited liquid-vapor stage; (f) vapor downcomer means defining a second vapor communication channel




leading from the vapor space immediately above the liquid space of the recited liquid-vapor stage to the vapor space immediately above the liquid space of the liquid-vapor stage immediately below the recited liquid-vapor stage, wherein the liquid downcomers and vapor downcomer maintain the liquids and vapors as separated distinct streams forced to flow downwardly in parallel flow by the absence of vapor outlet means at the top of the tower and wherein the vapor stream does not pass through any liquid in any successive lower stage; (g) means for introducing a liquid or a vapor from a source external to said apparatus into the liquid space of the liquid-vapor stage at a point below the liquid level in the liquid-vapor stage, or if only liquid is introduced, at a point above the liquid level of the liquid-vapor stage.

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4,314,887

## APPARATUS FOR PRODUCING COKE FROM FINE AND COARSE COAL

Jack R. Haley, Nashville; Jimmy B. Smith, Columbia, and Vaughn Mansfield, Gallatin, all of Tenn., assignors to Peabody Coal Company, Inc., St. Louis, Mo.

Division of Ser. No. 917,108, Jun. 19, 1978, Pat. No. 4,196,051. This application Aug. 14, 1979, Ser. No. 66,403
Int. Cl.[3] C10B 7/06, 31/00
U.S. Cl. 202—91 2 Claims

1. Appparatus for producing coke from a plurality of coals of respectively different type characteristics comprising:

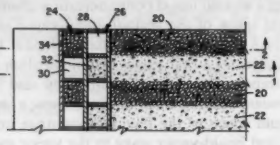
a coking furnace having input and output ends,

a continuous conveyor providing a flat conveyor run moving horizontally through the furnace from the input end to output end thereof,

at least two coal hoppers,

a plurality of spaced outlet means for feeding coal from one hopper onto the conveyor run at a plurality of locations

which are spaced from one another in a direction transverse to the direction of movement of the conveyor run so as to form a plurality of spaced rows of coal from one



hopper along the conveyor run, and another plurality of spaced outlet means for feeding coal from the other hopper onto the conveyor run into the spaces between the first mentioned rows.

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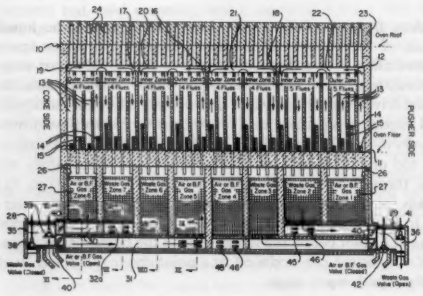
**4,314,888**

## ZONE CONTROL OF LEAN GAS UNDERFIRING FOR COKE OVENS

**Philip Corbman, Monsey, N.Y., and Paul V. Faber, Morristown, N.J., assignors to Wilputte Corporation, New Providence, N.J.**

**Filed Aug. 7, 1980, Ser. No. 176,072**
**Int. Cl.³ C10B** *5/02, 5/18, 21/02, 21/18*
**U.S. Cl. 202—143** **5 Claims**



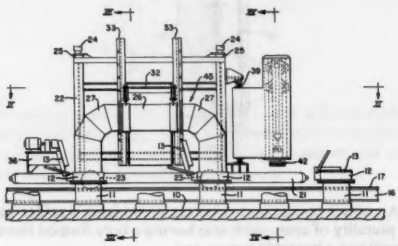
1. A coke oven battery having coke oven chambers with heating walls therefor and adapted when charged with wet or preheated coal to assume a varying bulk density of the charging coal from the coke side to the pusher side of the oven, wherein the improvement comprises an arrangement of vertical flues in each of said heating walls in an even number of spaced zones, sequentially positioned and extending from the coke side to the pusher side of the oven, each zone being defined by refractory partitions between which are a plurality of heating flues, refractory means defining passages between the top end of the flues in one zone and the top end of the flues in an adjoining zone, so as to form a pair of zones, a pair of horizontal ducts positioned side-by-side and extending below both zones of a pair, partition means in one of said ducts dividing it into separate spaces corresponding to the zones thereabove, a passage from one separate space in that duct into the corresponding zone of that pair and a passage from another separate space in that duct below the other zone of that pair into the adjoining horizontal duct.

**4,314,889**

## APPARATUS TO EXTRACT CHARGING GASES FROM A COKE OVEN CHAMBER

**Hans-Jurgen Kwasnik, Herne, and Hans-Gunter Piduch, Bochum, both of Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany**

**Filed Apr. 24, 1980, Ser. No. 143,245**
**Claims priority, application Fed. Rep. of Germany, May 19, 1979, 2920406**
**Int. Cl.³ C10B** *25/24, 27/04, 43/04*
**U.S. Cl. 202—241** **7 Claims**



1. Apparatus for a battery of coke ovens to extract charging gases through an orifice in the roof of one coke oven chamber and discharge the gases into an adjacent second oven chamber through an orifice in the roof thereof, said apparatus including the combination of means forming a cover including an annular water seal to normally close the orifice in the roof for each of said first and second coke oven chambers, a gas-transfer tube means including downwardly-extending tubular end portions to communicate with the orifices in the roof of said first and second oven chambers after removal of said cover therefrom, a car including means for vertically moving said gas-transfer tube means, means to support said car for movement along the battery of coke ovens, an annular member carried by said gas-transfer tube means for extending into the water seal associated with the orifice in the roof for each of said first and second coke oven chambers, and an orifice cleaning tool member supported by said car to pivot outwardly to an orifice and to move downwardly into the orifice for cleaning thereof.

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**4,314,890**

## AUTOMATICALLY FED DISTILLATION AND FRACTIONATION SYSTEM

**Boyd R. Beck, Spring City, Utah; Lamar H. Stewart, Gunnison, Utah 84634; Steven Tapp, Ephraim, Utah; Don L. Anderson, Jr., Gunnison, Utah, and Daniel E. Nuffer, Ephraim, Utah, assignors to Lamar H. Stewart, Gunnison, Utah**

**Continuation-in-part of Ser. No. 83,281, Oct. 10, 1979. This application Mar. 28, 1980, Ser. No. 134,878**
**Int. Cl.³ B01D** *3/42*
**U.S. Cl. 203—1** **6 Claims**

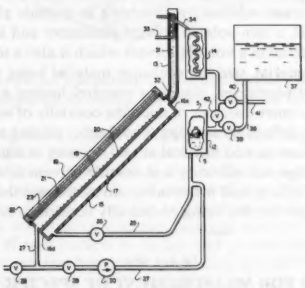
1. A method of separating ethanol from water-ethanol solutions which comprises the steps of:

(a) providing a system containing:

(1) an inclined still consisting of sidewalls, a lower endwall, an upper endwall, a bottom floor, and a translucent light transmitting top all being joined together to form a sealed still compartment, said compartment being divided into an upper vaporization chamber and a lower preheating chamber by a vaporization floor sealed to said sidewalls and lower endwall parallel to said bottom floor and translucent top, said vaporization floor terminating at its upper end short of said upper endwall, thereby forming a baffle over which liquid from said preheating chamber may overflow into said vaporization chamber, means located on the top surface of said vaporization floor to impede the downward flow of liquid on said surface, means located in said preheat-

ing chamber for heating said vaporization floor and liquid contained in the preheating chamber to a specified temperature, inlet means for introducing liquid mixture feed into the lower end of said preheating chamber, outlet means for removing residual liquid from the lower end of said vaporization chamber, and outlet means in said upper endwall for removing vapors formed within the still compartment;

(2) feed control means interconnected with the inlet means to said preheating chamber for controlling the amount of liquid that flows thereinto, said feed control means consisting of a feed chamber having an inlet and an outlet and a hydraulically operated float control valve, which valve controls the flow of feed liquid through the feed chamber to the preheating chamber, said float control valve being selectively positioned in said feed chamber such that, when liquid in the preheating chamber is below a specified temperature, the valve will remain closed, and when liquid in the preheating chamber is raised to at least said specified temperature, the liquid in the preheating chamber expands in volume, thereby becoming less dense, and is pushed over the baffle end of the vaporization floor by the more dense, cooler liquid feed in the feed chamber that flows by gravity through the outlet of the feed chamber to the preheating chamber, the exiting of liquid feed from the feed chamber causing the float control valve to open, thereby allowing feed liquid to flow through the inlet to



the feed chamber as long as the temperature of the feed liquid in the preheating chamber is above the specified temperature and the feed liquid is overflowing the baffle end of the vaporization floor; and

(3) an insulated condensation section interconnected with said still compartment consisting of a fractionation column which receives distilled vapors from the outlet means in the upper endwall of the still compartment, and condenser means for receiving and condensing vapors from the fractionation column into a distillate;

(b) feeding a water-ethanol solution to said system at ambient temperatures through the feed chamber of said feed-control means until said float control valve in the feed-control means closes;

(c) heating said vaporization floor and the water-ethanol solution contained in said preheating chamber to a specified temperature, causing said solution in this preheating chamber to boil and overflow onto the upper surface of the vaporization floor, and also causing the water-ethanol solution in the feed chamber of said feed-control means to flow by gravity into said preheating chamber, thereby opening said float control valve;

(d) causing the water-ethanol solution on said vaporization floor to be distilled into ethanol rich vapors and an ethanol depleted water solution;

(e) continuously passing water-ethanol solution through said feed chamber and float control valve to said preheating chamber and onto said vaporization floor as long as the temperature of such solutions in the preheating chamber and on the vaporization floor is sufficient to cause distillation to take place;

(f) withdrawing ethanol enriched vapors from said still compartment into said fractionation column wherein said vapors are fractionated into an ethanol vapor of higher purity;

(g) passing said ethanol vapors from the fractionation column to said condenser means where said vapors are condensed and removed as a concentrated ethanol solution; and

(h) removing ethanol depleted water solution from the lower portion of said vaporization chamber.

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**4,314,891**

**PROCESS FOR RECONCENTRATING MOIST GLYCOL**

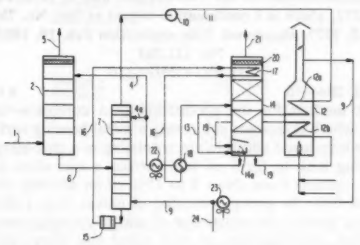
**Walter Knobel, Kerpen, Fed. Rep. of Germany, assignor to Davy International AG, Frankfurt, Fed. Rep. of Germany**

**Division of Ser. No. 919,234, Jun. 26, 1978, Pat. No. 4,273,620. This application Nov. 25, 1980, Ser. No. 210,326**

**Claims priority, application Fed. Rep. of Germany, Jun. 25, 1977, 2728745**

**Int. Cl.³ B01D** *3/34, 53/26;* **C07C** *29/80*

**U.S. Cl. 203—18** **6 Claims**



1. In a process for reconcentrating glycol which has been used to remove moisture from moist natural gas, whereby said moist natural gas is contacted with glycol and thereafer cooled to a temperature of from about −40° to +5° C. to form a condensate containing a liquid hydrocarbon phase, and whereby the moisture-containing glycol used to contact the natural gas is reconcentrated by removal of moisture therefrom, the improvement which comprises:

(a) heating said moisture-containing glycol to a temperature of from about 100° C. to 210° C. by heat exchange with flue gas from a reboiler; and thereafter

(b) stripping additional moisture from said moisture containing glycol with hydrocarbon gas which is formed by expanding the liquid hydrocarbon phase of said condensate.

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**4,314,892**

**MECHANICAL DAMAGE RESISTANT MEMBERS AND ELECTRO-PLATING RUBBER OR RUBBER-LIKE MATERIAL**

**James W. Stevens, Hatfield, United Kingdom, assignor to British Aerospace, Weybridge, England**

**Filed Dec. 13, 1979, Ser. No. 103,154**

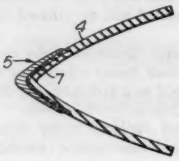
**Claims priority, application United Kingdom, Dec. 14, 1978, 48446/78; Sep. 6, 1979, 30986/79**

**Int. Cl.³ C25D** *5/00, 5/54*

**U.S. Cl. 204—38 B** **17 Claims**

1. A replaceable erosion-resistant cover for an airstream-exposed member, the cover comprising electrically conductive curable material having the elastically deformable nature of rubber and one surface of which has metal plating thereon and an opposite surface of which is pre-formed to at least nearly fit said member and is fixable thereto by adhesive, and the cover having been made by curing the curable material while press-

ing a discontinuously-surfaced layer of electrically conductive material onto said opposite surface of the curable material so




that portions of the electrically conductive material protrude into the surface and then electroplating the cured material over said layer.

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**4,314,893**

## PRODUCTION OF MULTIPLE ZINC-CONTAINING COATINGS

**Richard J. Clauss, Allen Park, Mich., assignor to Hooker Chemicals & Plastics Corp., Warren, Mich.**

**Continuation-in-part of Ser. No. 911,861, Jun. 2, 1978, Pat. No. 4,216,272, which is a continuation-in-part of Ser. No. 758,982, Jan. 13, 1977, abandoned. This application Feb. 19, 1980, Ser. No. 122,203**

**Int. Cl.³ C25D** *5/10*

**U.S. Cl. 204—40** **4 Claims**

1. A method for the production of a corrosion-resistant article which comprises subjecting a metal-bearing surface of steel or iron-based alloys to electroplating in a zinc-alloy electroplating bath to form on said surface a zinc-alloy deposit which contains from about 3 to 15% of an alloying element selected from the group consisting of nickel, iron, cobalt and mixtures thereof, the remainder of said alloy being zinc, and, thereafter, electroplating on said initial zinc-alloy coating a second zinc electrodeposit in which the content of the said alloying elements is at least 1.4% less than the content of the alloying elements in the said first deposit, the remainder of said alloy being zinc.

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**4,314,894**

## METHOD OF MAKING A MAGNETIC MEMORY LAYER

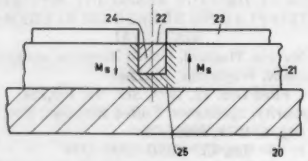
**Christoph Schmelzer, Seeheim; Reimar Spohr, Darmstadt-Wixhausen; Jens-Peter Krumme; Klaus Witter, both of Hamburg, and Heinrich Heitmann, Rellingen, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.**

**Division of Ser. No. 924,369, Jul. 13, 1978, Pat. No. 4,274,935. This application Nov. 17, 1980, Ser. No. 207,820**

**Claims priority, application Fed. Rep. of Germany, Jul. 16, 1977, 2732282**

**Int. Cl.³ C23C** *15/00*

**U.S. Cl. 204—192 M** **14 Claims**




1. A method of manufacturing a magnetic layer for storing information in the form of a fixed two-dimensional array of magnetic domains, which layer can be magnetized in either of two opposite directions, the boundaries of the domains being defined by local gradients in the magnetic properties of the magnetic layer, said magnetic properties including the value and direction of the magnetic anisotropy and the value and direction of the magnetic exchange energy, with the value of the magnetization remaining substantially unaltered, said method comprising the step of bombarding the magnetic layer with accelerated ions, the concentration of bombarding ions being greater at the domain boundaries than at other areas of the layer.

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**4,314,895**

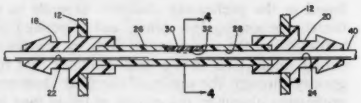
## METHOD OF MAKING LIQUID MEMBRANE ELECTRODE

**Frederick F. Spaziani, Lexington, and James E. Fowler, Watertown, both of Mass., assignors to Nova Biomedical Corporation, Newton, Mass.**

**Division of Ser. No. 925,518, Jul. 17, 1978, Pat. No. 4,233,136. This application May 2, 1980, Ser. No. 146,092**

**Int. Cl.³ B29C** *27/00;* **G01N** *27/30*

**U.S. Cl. 204—195 M** **2 Claims**




1. The method of forming an ion-sensitive membrane for an electrode chemically bonded to and integral with a sample flow-through tube of organic plastic material comprising forming a membrane solution by dissolving an organic plastic matrix material, a non-volatile solvent-plasticizer and an ion exchange material in a volatile solvent which is also a solvent for said tube material, said ion exchange material being soluble in said solvent-plasticizer, placing a mandrel having a diameter equal to the inner diameter of said tube coaxially of said tube at an opening defined by an edge of said tube, placing said membrane solution on said mandrel at said opening in contact with said tube edge and allowing said volatile solvent to evaporate therefrom to form said membrane, said membrane thus formed and said tube thereby being chemically bonded to each other.

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**4,314,896**

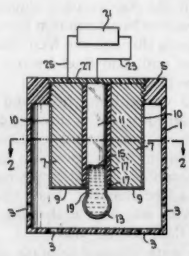
## SYSTEM FOR MEASUREMENT OF SPECIFIC IONS, SUCH AS SODIUM

**Ira Binder, New Rochelle, and Horace A. Teass, Jr., Armonk, both of N.Y., assignors to McNab Incorporated, Mt. Vernon, N.Y.**

**Continuation of Ser. No. 57,698, Jul. 16, 1979, abandoned. This application Feb. 17, 1981, Ser. No. 234,997**

**Int. Cl.³ G01N** *27/30*

**U.S. Cl. 204—195 R** **3 Claims**




3. A probe for use in the measurement of specific ion concentration in a fluid stream comprising an electrode pair composed of a specific ion sensitive glass tipped electrode with a self-contained gel and with the tip adapted to extend into the fluid stream and an annular metallic reference electrode having a

central area for receiving the glass tipped electrode with the tip adapted to extend into the fluid stream to a greater depth than the annular electrode which is solid and devoid of any gel or the like and is coated with a platinum group metal surface.

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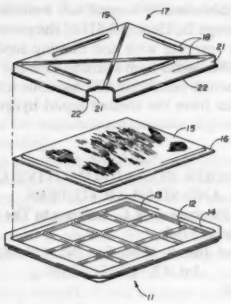
**4,314,897**

## ELECTROPHORETIC GEL CONTAINER

**Charles S. Monte, Orange, and Wayne S. Johnson, La Habra, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.**

**Filed Jul. 1, 1980, Ser. No. 165,165**
**Int. Cl.³ G01N *27/28***
**U.S. Cl. 204—299 R** **7 Claims**



**1.** A device for containing an electrophoretic gel specimen, said gel specimen including a lower surface, said device comprising:

a backing sheet in adherent contact with said lower surface, said sheet having a greater surface area than said contacted lower surface such that at least a portion of said sheet extends beyond said contacted lower surface;

a base configured to receive said backing sheet; and

a cover, cooperative with said base and contacting at least a part of said portion to secure said portion between said cover and said base, said cover being spaced from said gel specimen.

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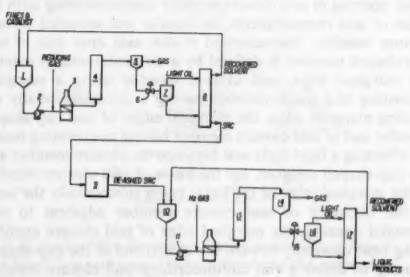
**4,314,898**

## PROCESS FOR REFORMING COAL

**Yukio Nakako, Takarazuka; Toshio Ohzawa, Kobe; Shizuo Yokota, Nishinomiya, and Masaaki Tamura, Kobe, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan**

**Filed Apr. 29, 1980, Ser. No. 144,883**
**Claims priority, application Japan, May 1, 1979, 54-054516**
**Int. Cl.³ C10G *1/00***
**U.S. Cl. 208—8 LE** **3 Claims**



**1.** In a process for reforming coal by subjecting a mixed slurry containing a hydrocarbon solvent and coal fines to hydrogenation reaction under high temperature and pressure conditions, gas-liquid separation, and distillation to obtain a solvent-refined coal, the improvement comprising:

maintaining the reaction temperature and total reaction pressure within a hydrogenation reactor at 400° to 500° C. and 50 to 200 atms., and

controlling the residence time distribution of reactants, excepting gaseous reactants, in the hydrogenation reaction zone to have an average residence time longer than 17 minutes, and to keep the quantity of said reactants which have a residence time shorter than 10 minutes in a proportion less than 20% by weight of said reactants.

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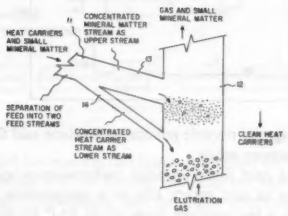
**4,314,899**

## SEPARATING SPENT MINERAL MATTER FROM HEAT CARRIERS

**Ralph E. Styring, Jr., Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.**

**Filed Dec. 23, 1980, Ser. No. 220,006**
**Int. Cl.³ B07B *11/06, 9/02***
**U.S. Cl. 208—11 R** **1 Claim**


CONCENTRATED MINERAL MATTER STREAM AS UPPER STREAM
GAS AND SMALL MINERAL MATTER
HEAT CARRIERS AND SMALL MINERAL MATTER
SEPARATION OF FEED INTO TWO FEED STREAMS
CONCENTRATED HEAT CARRIER STREAM AS LOWER STREAM
CLEAN HEAT CARRIERS
ELUTRIATION GAS

**1.** In a method of retorting the hydrocarbonaceous matter in crushed mined hydrocarbonaceous mineral bearing solids wherein said solids are retorted by contacting said solids with hot heat carriers thereby producing a mixture of pyrolyzed mineral matter in said solids and heat carriers and wherein a mixture of said pyrolyzed mineral matter and said heat carriers is fed to a chamber through which an elutriating gas is flowed, the improvement comprising (1) separating a mixture of pyrolyzed mineral matter solids and heat carrier solids into a first and second system, said first stream having a relative concentration of pyrolyzed mineral matter greater than the relative concentration of said pyrolyzed mineral matter in said mixture, said second stream having a relative concentration of heat carrier solids greater than the relative concentration of said heat carriers in said mixture, (2) feeding said first stream into an elutriation chamber at a first point, (3) feeding said second stream into said elutriation chamber at a second point, said second point being vertically lower than said first point, (4) flowing an elutriating gas upwardly through said solids fed into said chamber, and (5) removing at least a part of said pyrolyzed mineral matter from said chamber with said elutriating gas.

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**4,314,900**

## METHOD FOR PRODUCING DISTILLABLE HYDROCARBONACEOUS FUELS AND CARBONACEOUS AGGLOMERATES FROM A HEAVY CRUDE OIL

**Frank W. Theodore, Pittsburgh, and George E. Wasson, Eighty Four, both of Pa., assignors to Conoco Inc., Stamford, Conn.**

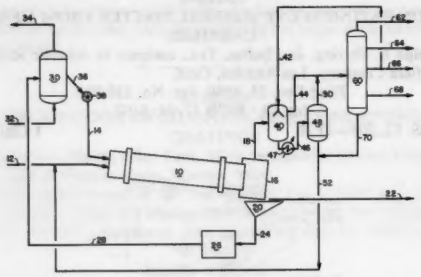
**Filed May 7, 1980, Ser. No. 147,454**
**Int. Cl.³ C10G *9/32***
**U.S. Cl. 208—126** **8 Claims**

**8.** A method for producing fuel gases, a distillable hydrocarbonaceous stream and carbonaceous agglomerates from a heavy crude oil feedstock, said method consisting essentially of (a) charging said crude oil and finely divided carbonaceous

solids to a rotary kiln, said crude oil and said finely divided carbonaceous solids being charged in a weight ratio of crude oil to carbonaceous solids from about 0.6 to about 1.50;

(b) tumbling said crude oil and said finely divided carbonaceous solids in said rotary kiln at a temperature from about 850° to about 1000° F. (about 450° to about 540° C.) for a residence time up to about 30 minutes to produce a vaporous stream and agglomerate particles containing a residual portion of said crude oil and said finely divided carbonaceous solids;

(c) separating said agglomerate particles into a product portion having a desired particle size and a recycle portion;



(d) grinding said recycle portion to produce said finely divided carbonaceous solids;

(e) heating said finely divided carbonaceous solids prior to charging to said rotary kiln to a temperature sufficient to result in a temperature from about 850° to about 1000° F. (about 450° to about 540° C.) in said rotary kiln upon mixing said finely divided carbonaceous solids and said crude oil;

(f) mixing said finely divided carbonaceous solids and said crude oil feed stock, said finely divided carbonaceous having been separated as agglomerate particles into a recycle portion and ground into finely divided carbonaceous solids and heated prior to being mixed with said heavy crude oil feed stock.

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## 4,314,901
## CATALYTIC HYDRODESULFURIZATION OF AN ORGANIC SULFUR COMPOUND CONTAINED IN GASOLINE

**Gerhard P. Nowack, and Marvin M. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Jul. 15, 1980, Ser. No. 169,010**
**Int. Cl.³ C10G *45/04***
**U.S. Cl. 208—216 R** **10 Claims**

1. A process for the catalytic hydrodesulfurization of an organic compound contained in a gasoline comprising the 65° F.–430° F. hydrocarbon fraction produced by the catalytic cracking of heavier hydrocarbon fractions, wherein said gasoline contains olefis, said process comprising the steps of:

contacting a suitable nitrogen compound and said gasoline under suitable hydrodesulfurization conditions with a catalyst composition comprising catalytic grade alumina and a catalytic component at least one member of which is selected from the group consisting of molybdenum and tungsten, wherein the rate at which said catalyst composition is contacted with said suitable nitrogen compound is in the range of about 0.1 to about 2.0 milliequivalents of said suitable nitrogen compound per hour per gram of said catalyst composition.

## 4,314,902
## CATALYTIC WATER WASH

**Raymond S. Bouk, deceased, late of North Hollywood, Calif., and by Barbara Bouk, heir, 11344 Hatteras St., North Hollywood, Calif. 91503**

**Continuation-in-part of Ser. No. 196,842, Nov. 8, 1971, abandoned, which is a continuation of Ser. No. 769,722, Oct. 22, 1968, abandoned. This application Jan. 3, 1974, Ser. No. 430,642**
**Int. Cl.² C10G *19/02, 27/00, 29/12;* A61L *1/00***
**U.S. Cl. 208—254 R** **12 Claims**

1. A process of eliminating impurities including viable forms of microbial contamination and preventing microbial recontamination in liquid hydrocarbons comprising treating said hydrocarbons with an aqueous solution comprising an oxidizing compound and a mixture of metallic salts in which a first salt contains a metal ion selected from groups IB, IVa and Va of the periodic table and a second salt contains a metal ion selected from groups Ia, IIa and VIII of the periodic table, said aqueous solution reacting with and causing separation of said impurities from the liquid hydrocarbon into the aqueous solution, and subsequently removing said aqueous solution containing said impurities from the treated liquid hydrocarbon.

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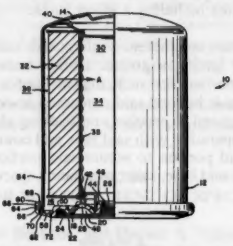
## 4,314,903
## CLOSURE MEMBER FOR AUTOMOTIVE OIL FILTERS AND SIMILAR FILTERS

**William Hanley, Pawtucket, R.I., assignor to The Bendix Corporation, Southfield, Mich.**

**Filed Jun. 5, 1980, Ser. No. 156,882**
**Int. Cl.³ B01D *27/08***
**U.S. Cl. 210—440** **3 Claims**



1. In an automotive oil filter, a housing defining a chamber therein, said housing including a cupshaped member having a circumferentially extending wall defining an axis and an open end and a closure member closing said open end, an annular fluid permeable filtering element within said housing chamber, said filtering element dividing said chamber into a pair of compartments, said closure member including a threaded opening communicating with one of said compartments, another opening in said closure member communicating with the other of said compartments, an annular seal mounted on said closure member, characterized in that said open end of said cup-shaped member is defined by a circumferentially extending marginal edge, said closure member being a stamping consisting of a single member having a circumferentially extending marginal edge, the marginal edges of said cup-shaped member and of said closure member having cooperating means for effecting a fluid-tight seal between the closure member and the cup-shaped member, the thickness of said closure member at the marginal edge of the latter being substantially the same as the thickness of said closure member adjacent to said threaded opening, the marginal edge of said closure member being bent upwardly toward the closed end of the cup-shaped housing to define a rim circumscribing said closure member and projecting perpendicularly from the latter toward the closed end of the cup-shaped housing, said cooperating means including an outwardly projecting bead circumscribing the marginal edge of said cup-shaped member, said marginal edge

of said closure member extending generally parallel to the circumferentially extending wall of said cup-shaped member, and a circumferentially extending channel defined on said marginal edge of said closure member for receiving said bead, the marginal edge of said closure member terminating in a section projecting inwardly toward the circumferentially extending wall of the cup-shaped member, said inwardly projecting section cooperating with the rest of the closure member to define said channel, wherein said fluid-tight seal is effected by crimping the marginal edge of said closure member against said bead.

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4,314,904

## ANAEROBIC DIGESTION OF WASTE AND BIOMASS BY USE OF LACTOBACILLUS CULTURE ADDITIVES

**Paul A. Fedde, Owensboro, Ky.; Sambhunath Ghosh, Homewood, Ill.; Michael P. Henry, Willowbrook, Ill., and Donald L. Klass, Barrington, Ill., assignors to Transagra Corporation, Memphis, Tenn.**

**Filed Dec. 12, 1979, Ser. No. 102,924**
**Int. Cl.³ C02F *3/34***
**U.S. Cl. 210—611** **20 Claims**

1. A method for improving anaerobic digestion of waste and biomass, comprising:

(a) obtaining a nonviable lactobacillus fermentation product as a secondary anaerobic digester additive;

(b) introducing said lactobacillus fermentation product into an anaerobic digester system in a volume concentration from about 10 to about 1,000 ppm of digester liquid volume so that said digesting system digests the wastes and biomass at a greater-than-normal rate, and

(c) maintaining the pH of said digester system from between about 6.4 to about 7.4.

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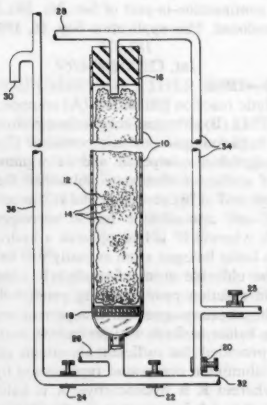
4,314,905

## COLUMNAR FINE MESH MAGNETIZED ION EXCHANGE RESIN SYSTEM

**James E. Etzel, Lafayette, Ind., and Anthony M. Wachinski, Panama City, Fla., assignors to Purdue Research Foundation, Lafayette, Ind.**

**Continuation of Ser. No. 957,182, Nov. 2, 1978, abandoned. This application Apr. 25, 1980, Ser. No. 143,663**
**Int. Cl.³ B01J *49/00***
**U.S. Cl. 210—670** **14 Claims**




9. A method for the ion exchange treatment of liquids with fixed-bed ion exchange resins comprising the steps of:

conveying liquid to be treated to the inlet of a column, said column containing fine mesh ion exchange particles having a core of magnetic material encapsulated in an ion exchange resin magnetically attached to and distributed substantially throughout magnetic mesh retention means which loosely fills said column, said ion exchange particles being retained by said retention means in said column during both operation and regeneration of said ion exchange particles thereby providing a fixed-bed ion exchange resin for the ion exchange treatment of liquids;

contacting said liquid with said resin particles in said column for a time sufficient to effect an ion exchange; and

conveying the treated liquid out of the column.

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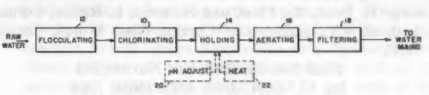
4,314,906

## WATER PURIFICATION BY CHLORINATING, HOLDING, AND AERATING

**Howard E. Dunn, Mount Vernon, and Robert L. Koch, II, Evansville, both of Ind., assignors to George Koch Sons, Inc., Evansville, Ind.**

**Continuation of Ser. No. 91,089, Nov. 5, 1979, abandoned, which is a continuation-in-part of Ser. No. 712,872, Aug. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 634,901, Nov. 24, 1975, abandoned. This application Feb. 17, 1981, Ser. No. 235,017**
**Int. Cl.³ C02F *1/76***
**U.S. Cl. 210—754** **10 Claims**




1. A method for treating raw water from reservoirs, lakes, or streams to render it fit for human consumption, the said water containing microorganisms and naturally occurring organic substances known to react with chlorine to yield one or more halogenated organic compounds, which method comprises the steps of adding from about 2 to about 20 p.p.m. of chlorine to the water to kill said microorganisms, holding the chlorine-containing water at a temperature between about 10° and about 50° C. and a pH between about 7.5 and about 9 for a period of at least about 3 hours, to react said chlorine with said naturally occurring organic substances and produce said halogenated organic compounds, and thereafter aerating the chlorine-treated water, to remove said halogenated organic compounds therefrom.

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4,314,907

## OIL ADDITIVE COMPOSITIONS FOR INTERNAL COMBUSTION ENGINES

**Francis Defretin, Hallluin; Jean-Paul Eudeline, Boulogne Billancourt; Elisabeth Schoch, Rambouillet, and Alain Voisin, Farbus, all of France, assignors to PCUK Produits Chimiques Ugine Kuhlmann, Courbevoie, France**

**Filed Nov. 6, 1979, Ser. No. 92,080**
**Claims priority, application France, Nov. 7, 1978, 78 31421**
**Int. Cl.³ C10M *3/02, 3/42***
**U.S. Cl. 252—22** **11 Claims**

1. An oil additive composition for internal combustion engines consisting essentially of at least one metal dithiophosphate, at least one fatty amide, where the fatty amide has the formula:

$$R—CO—NH—R$$

or

$$R—CO—[NR'—R''—NR']—CO—R$$

where R is a saturated or unsaturated hydrocarbon group having from 8 to 36 carbon atoms, R' is hydrogen or the group COR and R'' is an alkylene group having from 2 to 6 carbon atoms, and a fluorographite $CF_x$, where x is between about 0.6 and 1.

4,314,908

## PREPARATION OF REACTION MASS FOR THE PRODUCTION OF METHYLCHLOROSILANE

James H. Downing, Clarence; James E. Wells, III, Kenmore, both of N.Y., and Tom K. Ioannou, Marietta, Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 24, 1979, Ser. No. 87,798
Int. Cl.[3] B01J *23/72;* C22C *30/02*
U.S. Cl. 252—182 17 Claims

1. A copper-catalyzed silicon reaction mass for the production of methylchlorosilanes which comprises freeflowing particles of silicon metal having spots of a copper-silicon alloy substantially uniformly distributed on the surface of the silicon particles, the copper constituting less than about 2% by weight of the catalytic mass.

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4,314,909

## HIGHLY REFRACTORY GLASS-CERAMICS SUITABLE FOR INCORPORATING RADIOACTIVE WASTES

George H. Beall, Big Flats, and Hermann L. Rittler, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,363
Int. Cl.[3] C03C *3/04, 3/22;* H01B *1/08*
U.S. Cl. 252—629 3 Claims

1. A glass-ceramic especially suitable for incorporating radioactive wastes wherein the crystal phases thereof consist essentially of monazite and pollucite and at least one of the group mullite, and $ZrO_2$, said glass-ceramic consisting essentially, expressed in weight percent on the oxide basis, of 5–40% $Cs_2O$, 15–50% $Al_2O_3$, 5–30% $La_2O_3+CeO_2$, up to 20% $P_2O_5$, 0–30% $ZrO_2$, 12–65% $La_2O_3+CeO_2+P_2O_5+ZrO_2$, and 15–50% $SiO_2$.

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4,314,910

## LUMINISCENT MATERIALS

Roderick G. L. Barnes, 45 Flambards Close, Meldreth, near Royston, Hertfordshire, England (SG8 6JX)

Continuation-in-part of Ser. No. 7,729, Jan. 30, 1979, abandoned, which is a continuation of Ser. No. 826,749, Aug. 22, 1977, abandoned. This application Jan. 20, 1980, Ser. No. 123,771
Claims priority, application United Kingdom, Sep. 3, 1976, 38615/76
Int. Cl.[3] C09K *11/463*
U.S. Cl. 252—301.4 R 9 Claims

1. A luminescent material comprising an yttrium-scandium-gallium-aluminum garnet activated by trivalent cerium and having the formula:

$$Y_{3-x}Ce_xSc_yGa_zAl_{(5-(y+z))}O_{12}$$

in which $0.02 \leqq x \leqq 0.1$, $0.5 \leqq y \leqq 2$ and $1 \leqq z \leqq 3$, provided that $(y+z)$ is less than 5, said material being capable, under cathode ray excitation, of emitting with high efficiency over a broad wavelength band peaking in the green or blue/green region between about 500 and 550 nm and having a decay time of less than $10^{-6}$ seconds, said material exhibiting brighter luminescense on cathode ray excitation than the corresponding yttrium-gallium-aluminum garnet activated by trivalent cerium in which the scandium is replaced by gallium.

4,314,911

## POLYMERIZATION CATALYST

Umberto Giannini; Paolo Longi; Domenico Deluca, and Angelo Pricca, all of Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Continuation of Ser. No. 530,205, Dec. 6, 1974, abandoned, which is a continuation of Ser. No. 167,872, Jul. 30, 1971, abandoned. This application Aug. 23, 1979, Ser. No. 69,363
Claims priority, application Italy, Jul. 31, 1970, 28131 A/70
The portion of the term of this patent subsequent to May 5, 1998, has been disclaimed.
Int. Cl.[3] C08F *4/02, 4/64*
U.S. Cl. 252—429 A 25 Claims

1. Catalysts for polymerizing olefins and obtained by mixing:
(a) a catalyst-forming component which is a hydride or organometallic compound of a metal belonging to Groups I to III of the Mendelyeev Periodic Table, and
(b) a catalyst-forming component prepared by cogrinding (1) a titanium compound selected from the group consisting of titanium halides, oxyhalides, halo-alcoholates and alcoholates, ammonium halotitanates, alkyl-ammonium halo-titanates, halotitanates of alkaline metals, ammonium titanates, alkyl-ammonium titanates, alkaline metal titanates, titanium amides, titanium haloamides, titanium salts of organic acids, and addition compounds of titanium with electron-donors, with a carrier consisting of (2) an anhydrous compound of a metal belonging to Groups III to IV of the Mendelyeev Periodic Table selected from the group consisting of aluminum oxide, lead dichloride, silicon oxide, titanium dioxide, aluminum sulphate, titanyl sulphate, aluminum phosphate and boric anhydride, and (3) an anhydrous normal magnesium or manganese dihalide, until the magnesium or manganese dihalide is activated by the cogrinding to a condition such that the surface area thereof is greater than 3 $m^2/g$, the amount of the metal compound (2) being from 30% to 80% by weight of (2) and (3).

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4,314,912

## HIGH EFFICIENCY, HIGH TEMPERATURE CATALYST FOR POLYMERIZING OLEFINS

Kirby Lowery, Jr.; George W. Knight, and James A. May, Jr., all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 765,182, Feb. 3, 1977, Pat. No. 4,250,288, which is a continuation-in-part of Ser. No. 581,294, May 27, 1975, abandoned. This application Sep. 16, 1980, Ser. No. 187,676
Int. Cl.[3] C08F *4/64*
U.S. Cl. 252—429 B 10 Claims

1. A catalytic reaction product of (A) compound of a transition metal (TM), (B) an organomagnesium component selected from (1) an organomagnesium compound or (2) a complex of an organomagnesium compound and an organometallic compound in an amount sufficient to solubilize the organomagnesium compound in hydrocarbon and (C) an active non-metallic halide, said non-metallic halide corresponding to the formula R'X wherein R' is hydrogen or a hydrocarbyl group containing a labile halogen atom as easily lost to another compound as the chloride atom of sec-butyl chloride and X is halogen; said reaction product being produced in a manner such that the organomagnesium component reacts with the non-metallic halide to form a hydrocarbon insoluble portion, and further provided that sufficient aluminum, in the form of a hydrocarbylaluminum compound represented by the formula $R_{3-a}AlX_a$ wherein R is hydrocarbyl, X is halide and a is a number from 0 to 1.5, is present in the catalytic reaction product in an amount sufficient to provide a reaction product that is catalytic for the polymerization of an α-olefin; the proportions of the foregoing components of said catalytic reaction product being such that the atomic ratio of Mg:TM is within the range from about 5:1 to about 2000:1, the atomic ratio of X:TM is within the range from about 40:1 to about 2000:1, the

atomic ratio of Mg:X is within the range from about 0.2:1 to about 1:1, the atomic ratio of Mg:Al is at least 0.3:1, and the atomic ratio of Al:TM is not more than about 120:1, said reaction product being useful as a catalyst for the polymerization of an α-olefin.

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4,314,913

**CATALYST FOR REMOVING $NO_x$ FROM GAS STREAMS**

**Jean-Yves Derrien, Bourg-la-Reine, and Laurent Seigneurin, Salindres, both of France, assignors to Rhone-Poulenc Industries, Paris, France**

**Filed Mar. 4, 1980, Ser. No. 127,106**

**Claims priority, application France, Mar. 5, 1979, 79 05598**

**Int. Cl.³ B01J** *21/04, 23/22, 23/74*

**U.S. Cl. 252—464** **8 Claims**

1. A catalyst which comprises a catalytically active metallic oxide deposited on a porous support with the metallic oxide being selected from the group consisting of the oxides of vanadium, iron and cobalt and with the metallic oxide comprising from 0.5 to 20% by weight of the catalyst, wherein the improvement comprises said support being a porous alumina support and comprising a volume of pores having diameters larger than 1000 A in excess of 25 $cm^3/100$ g, a volume of pores having diameters larger than 300 A in excess of 40 $cm^3/100$ g, a total pore volume of from about 80 $cm^3/100$ g to 120 $cm^3/100$ g, and a surface area of less than 160 $m^2/g$.

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4,314,914

**CATALYST SUPPORTING BED**

**Kazuo Uede, Ikoma; Tuguo Sumizaki, Neyagawa, and Masatoshi Nakamura, Osaka, all of Japan, assignors to Koei Chemical Co., Ltd., Osaka, Japan**

**Filed Jan. 2, 1980, Ser. No. 109,024**

**Claims priority, application Japan, Mar. 2, 1979, 54-24672**

**Int. Cl.³ B01J** *23/74, 35/02*

**U.S. Cl. 252—472** **5 Claims**

1. A catalyst supporting bed in a vertical reactor for production of formaldehyde by gas phase catalytic dehydrogenation of methanol in the presence of a solid metal catalyst, characterized in that the bed is incurvated and is made of a nickel alloy having a nickel content of not less than 25% by weight at least at the surface.

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4,314,915

**USES IN PERFUMERY OF ETHER DERIVATIVES OF INDANES**

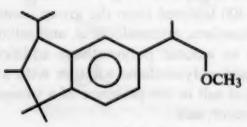
**Wilhelmus J. Wiegers, Red Bank; Mark A. Sprecker, Sea Bright; Hugh Watkins, Lincroft; Manfred H. Vock, Locust, and Frederick L. Schmitt, Holmdel, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.**

**Division of Ser. No. 63,374, Aug. 3, 1979, Pat. No. 4,250,200. This application Nov. 13, 1980, Ser. No. 206,687**

**Int. Cl.³ A61K** *7/00*

**U.S. Cl. 252—522 R** **3 Claims**

1. A process for augmenting or enhancing the aroma of a perfume composition comprising the step of intimately admixing with a perfume base an aroma augmenting or enhancing quantity of a mixture of indane alkanol methyl ethers having the structures:

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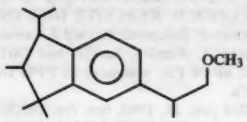


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4,314,916

**PROCESS FOR THE PRODUCTION OF BROKEN DOWN LIGNIN-CELLULOSE SILICATE COPOLYMERS**

**David H. Blount, 5450 Lea St., San Diego, Calif. 92105**

**Division of Ser. No. 203,730, Nov. 3, 1980, which is a continuation-in-part of Ser. No. 112,290, Jan. 15, 1980, which is a continuation-in-part of Ser. No. 29,202, Apr. 12, 1979, Pat. No. 4,222,757. This application Apr. 27, 1981, Ser. No. 257,950**

**Int. Cl.³ C08L** *1/10;* **C08B** *31/00*

**U.S. Cl. 260—13** **12 Claims**

1. The process for the production of polyurethane silicate product by the following steps:

(a) mixing and reacting a broken down alkali metal lignin-cellulose silicate polymer and a substituted organic compound having at least two carbon atoms, each of which is attached to a substituent which will split off during the reaction, to said broken down alkali metal lignin-cellulose silicate polymer in the amount wherein the mols of the substituent radicals are about equal to the mols of the alkali radicals in the mixture thereby producing a broken down lignin-cellulose silicate copolymer;

(b) mixing and reacting 1 to 95 parts by weight of the broken down lignin-cellulose silicate copolymer and 50 parts by weight of a polyisocyanate or a polyisothiocyanate thereby producing a polyurethane silicate product.

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4,314,917

**HIGH-SOLIDS EPOXY PREPOLYMER COATING COMPOSITION**

**Austin A. Wolfrey, Peabody, Mass., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Feb. 12, 1980, Ser. No. 120,861**

**Int. Cl.³ C08L** *63/04*

**U.S. Cl. 260—18 EP** **8 Claims**

1. A pigmented, high-solids curable composition comprising

(a) an epoxidic prepolymer blend comprising

(i) a diglycidyl ether of cyclohexanedimethanol;

(ii) a diglycidyl ether of Bisphenol A;

(iii) a polyepoxidized phenol or cresol novolak;

(iv) a polyglycidyl ether of a polyhydric alcohol;

(v) an epoxidic ester having two epoxycycloalkyl groups; or

(vi) a mixture of any of the foregoing; and

(b) from 0.5 to 35 parts by weight to 100 parts by weight of (a) and (b) combined of a catalyst comprising

(i) a diaryliodonium salt of the formula

$$[(R)_a(R^1)_bI]^+_c[MQ_d^-]^{(d-e)}$$

wherein R is a monovalent organic radical, $R^1$ is a divalent aromatic organic radical, M is a metal or metalloid, Q is a halogen radical, a is a whole number equal to 0 or 2, b is a whole number equal to 0 or 1 and the sum of a+b is equal to 2 or the valence of I, c=d−e, e equals the valence of M and is an integer equal to 2-7 inclusive and d>e and is an integer having a value up to 8; and

(ii) from 0.1 part to 10 parts, per part of (i), of a copper salt; and

(iii) from 0.1 part to 10 parts, per part of (i) and (ii) combined, of a tin salt; and

(c) from 10 to 100 parts by weight, per 100 parts by weight of (a) and (b) of a pigment.

## 4,314,918
## COATING COMPOSITIONS CONTAINING ORGANIC ALCOHOLIC REACTIVE DILUENTS

William J. Birkmeyer, Oakmont; Ronald J. Lewarchik, Natrona Heights; Joseph A. Klanica, Sarver, and Carl C. Anderson, Allison Park, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 26, 1980, Ser. No. 163,354
Int. Cl.[3] C09D *3/58, 3/64*
U.S. Cl. 260—20 15 Claims

1. A coating composition capable of liquid application to a substrate, the vehicle portion of the composition, on a weight solids basis, consisting essentially of:

(a) from about 35% to about 55% of a crosslinking agent;

(b) from about 15% to about 50% of a curable polyol resin; and

(c) from about 15% to about 50% of a reactive diluent derived from the reaction of (i) from about 0.25 to about 4 moles of a glycidyl ester with (ii) each mole of a functional material having a molecular weight of less than about 1000, a hydroxy equivalent weight of from about 30 to about 1000 and a carboxy equivalent weight of from about 50 to about 1000, provided the total hydroxyl and carboxyl functionality of the functional material is at least 2.0, said reactive diluent characterized in having an acid number of less than about 50, a non-volatile content of greater than about 85% and a Gardner-Holdt viscosity of less than Z-10.

## 4,314,919
## METHOD OF THICKENING LIQUID POLYESTER SYSTEM WITH CLAY

Frank J. Washabaugh, Titusville, and William C. Goble, Old Bridge, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed Mar. 12, 1980, Ser. No. 129,521
Int. Cl.[3] C08L *91/00*
U.S. Cl. 260—22 CB 10 Claims

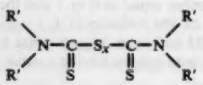
1. A process for preparing a thixotropic unsaturated liquid polyester composition from an unsaturated liquid polyester resin system comprising a polyester and an ethylenically unsaturated monomer, wherein said monomer is present in amount less than 35% based on the weight of said polyester, by adding to said polyester resin system a cationic quaternary ammonium surfactant and then mixing directly therewith a colloidal gelling grade clay in amounts and at shear rates sufficient to form said thixotropic composition.

## 4,314,920
## POLYSULFIDE RUBBERS SUITABLE FOR HOT APPLICATION

Edward G. Millen, Princeton, NJ, assignor to Thiokol Corporation, Newtown, Pa.

Division of Ser. No. 913,631, Jun. 8, 1978, Pat. No. 4,263,078. This application Mar. 12, 1980, Ser. No. 129,541
Int. Cl.[3] C08L *93/00*
U.S. Cl. 260—24 22 Claims

1. A curable composition comprising a thiol terminated liquid polysulfide polymer, a curing amount of zinc oxide, and a sulfur containing compound selected from 2-mercaptobenzothiazole, zinc diloweralkyldithiocarbamate, and alkyl thiuram polysulfides of the formula:



wherein x is from about 2 to about 6 and R′ is alkyl of from 1 to about 10 carbon atoms either straight chain, branched chain or cyclic, or the R′ moieties attached to the same nitrogen atom may be concatenated and taken together with said nitrogen atom form a heterocyclic ring, and at least one extrudability improver selected from copolymers of styrene with alkylenes, phenolic resins, coumarone-indene resins, polyalkylene polymers, factice, terpene resins, terpene resin esters, benzothiazyl disulfide and diphenyl guanidine.

## 4,314,921
## METHOD AND APPARATUS FOR PREPARING A BITUMINOUS BINDER

Günter Biegenzein, Viena, Austria, assignor to Novophalt SA, Luxembourg

Filed Jan. 14, 1980, Ser. No. 111,946
Int. Cl.[3] C08L *91/00*
U.S. Cl. 260—28.5 AS 25 Claims

1. Method for preparing a bituminous binder for construction materials containing dispersed solid, predominantly inorganic additive substances, which comprises homogenizing a blend of bitumen and at least one polyolefin selected from the group consisting of polyethylene and polypropylene in a heated mixing vessel while stirring the blend and melting and dissolving the polyolefin in the bitumen, the blend being heated to a temperature between 260° C. and 310° C., forcing the blend through a narrow passage defined by a mixing element and having a width of less than 3 mm to subject the blend to forceful mixing under a high shearing force having a shearing stress of at least 20 meters/second, and continuing the homogenization until the polyolefin has been degraded and the viscosity of the homogenized blend has been reduced below a viscosity reduction attendant upon the mere heating of the blend at said temperature.

## 4,314,922
## PROCESS FOR THE PREPARATION OF AQUEOUS POLYURETHANE DISPERSIONS

August Lehner, Roedersheim-Gronau; Alexander Kud, Enkenbach-Alsenborn, and Heinrich Hartmann, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 5, 1981, Ser. No. 231,720
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1980, 3005010
Int. Cl.[3] C08L *75/12*
U.S. Cl. 260—29.2 TN 7 Claims

1. A process for preparing an aqueous polyurethane dispersion which comprises

(a) forming a polyurethane solution by reacting an organic polyisocyanate in the presence of an organic solvent with

(i) an acrylic ester diol having a molecular weight of between 146 and 3,000;

(ii) an organic polyhydroxyl compound other than (i) having a molecular weight between 400 and 5,000 selected from the group consisting of polyester polyols, polyether polyols, polycarbonates, polylactones, and mixtures thereof; and

(iii) a chain extender having a molecular weight between 62 and 400 selected from the group consisting of diols, triols, diamines, aminoalcohols, and mixtures thereof;

(b) forming an anionic polyurethane addition product by reacting said polyurethane solution with a mercaptocarboxylic acid salt in the presence of a solvent;

(c) adding water; and

(d) removing the organic solvent.

4,314,923

## COATING COMPOSITIONS FORMULATED FROM POLYOLS MODIFIED BY REACTION WITH GLYCIDYL ETHER

Wen-Hsuan Chang, Gibsonia; Robert Piccirilli, Pittsburgh, both of Pa., and David A. Diehl, S. Milwaukee, Wis., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 4, 1980, Ser. No. 156,529
Int. Cl.³ C08L 61/28, 61/24
U.S. Cl. 260—29.4 R 21 Claims

1. A coating composition comprising (A) a solvent medium (B) a modified polyol component having a number average molecular weight below about 700 and a viscosity of less than about 20 poises, at 80 percent concentration in water, derived by the reaction of (1) a precursor polyol in which the predominant constituent contains at least three hydroxyl groups with (2) a glycidyl ether, in a molar ratio of about 0.1 to about 4 moles of (2) per mole of (1) and (C) an aminoplast resin compatible with (A) and (B); the amount by weight of (A) being from about 0 to about 95 percent of the total composition; the amount by weight of (B) and (C) combined being from about 5 to about 100 percent of the total composition and the amount by weight of each of (B) and (C) being from about 20 to about 80 percent of the amount of (B) and (C) combined.

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4,314,924

## THIXOTROPIC AGENT FOR USE IN COATING COMPOSITIONS

Karlheinz Haubennestel, and Rainer Mehren, both of Wesel, Fed. Rep. of Germany, assignors to Byk-Mallinckrodt Chemische Produkte GmbH, Wessen, Fed. Rep. of Germany

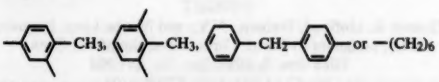
Filed May 25, 1979, Ser. No. 42,716
Claims priority, application Fed. Rep. of Germany, May 26, 1978, 2822908
Int. Cl.³ C08G 71/02; C08K 5/41, 5/21; C08L 5/24
U.S. Cl. 260—30.6 R 13 Claims

1. Thixotropic compositions which manifest thixotropic properties only upon subsequent introduction into coating compositions, comprising urea urethanes of the following formula dissolved in a polar aprotic solvent containing 0.1 to 2.0 mol LiCl per urea group

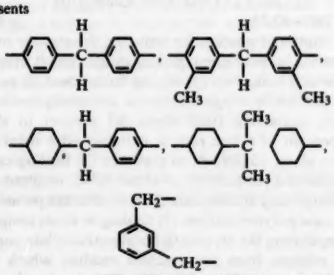
R—O—CO—NH—R'—NH—CO—NH—R''—N-
H—CO—NH—R'—NH—CO—OR

wherein R represents $C_nH_{2n+1}$— or $C_mH_{2m+1}(C_pH_{2p}O)_r$—; n represents an integer having a value of from 4 to 22; m represents an integer having a value of from 1 to 18; p represents an integer having a value of from 2 to 4; and r represents an integer having a value of from 1 to 10,

R' represents




R'' represents




4,314,925

## CURABLE COMPOSITIONS

Sandra Berazosky, and Harry A. Smith, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 81,295, Oct. 2, 1979. This application Feb. 26, 1981, Ser. No. 238,300
Int. Cl.³ C08K 5/06
U.S. Cl. 260—33.2 R 12 Claims

1. A curable composition comprising:

(A) x parts by weight of a hydroxyl-bearing polymer;

(B) about 0.05x to about 3.0x parts by weight, which represents y-moles, of a liquid polyglycol hemi-formal diluent of the formula

$$RO\text{-}(CH_2\text{—}\underset{R'}{CH}\text{—}O)_n\text{-}CH_2\text{—}OH$$

wherein R is a hydrocarbyl group of 1 to about 20 carbon atoms, R' is independently each occurrence hydrogen or methyl, and n is a positive number; and

(C) an aminoplast or phenolic resole resin, capable of curing component (A) to a tack-free state, present in a quantity of from about (0.20x+z) to about (2.5x+5z) parts by weight, z being equal to y multiplied by the equivalent weight of said aminoplast or phenolic resole resin.

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4,314,926

## HOT MELT ADHESIVE AND ADDITIVE THEREFORE

George M. Allison, III, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 12, 1980, Ser. No. 148,878
Int. Cl.³ C08K 5/01; C08L 53/00
U.S. Cl. 260—33.6 AQ 8 Claims

1. Hot melt adhesive having improved holding power comprising

(a) a conjugated diene/monovinyl aromatic copolymer component comprising at least one of

(aa) non-hydrogenated conjugated diene/monovinyl aromatic copolymers,

(bb) hydrogenated conjugated diene/monovinyl aromatic copolymers with extender oil,

(b) a modifying agent compatible with the conjugated diene section of the copolymer,

(c) poly(alpha-methylstyrene)

(d) polyphenylene oxide.

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4,314,927

## FLAMEPROOFED FILLED NYLON MOLDING MATERIALS

Rainer Theysohn, Ludwigshafen, and Horst Reimann, Worms, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 27, 1980, Ser. No. 153,705
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1979, 2922663
Int. Cl.³ C08K 3/02, 5/34
U.S. Cl. 260—37 N 5 Claims

1. A thermoplastic molding composition which contains

1. 100 parts by weight of nylon 6.6

2. 10–100 parts by weight of glass fibers

3. 1–12 parts by weight of red phosphorus and

4. 1–40 parts by weight of melamine cyanurate.

## 4,314,928
## POLYETHYLENE TEREPHTHALATES WHICH CRYSTALLIZE RAPIDLY AND A PROCESS FOR THEIR PREPARATION

**Peter Bier, and Rudolf Binsack, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Continuation of Ser. No. 67,860, Aug. 20, 1979, abandoned, which is a continuation of Ser. No. 875,048, Feb. 3, 1978, abandoned. This application Jun. 30, 1980, Ser. No. 164,458**

**Claims priority, application Fed. Rep. of Germany, Feb. 14, 1977, 2706123**

**Int. Cl.³ C08L *67/00***

**U.S. Cl. 260—40 R** **7 Claims**

1. A process for the production of a highly crystalline thermoplastic copolyester which crystallizes rapidly on cooling from above the melt temperature of the copolyester;

(A) said copolyester having an intrinsic viscosity of at least 0.4 dl/g (at 25° C. in 1:1 phenol tetrachloroethane); and consisting of the condensation product of

(1) a dicarboxylic acid component which is at least 90 mol percent terephthalic acid;

(2) ethylene glycol; and

(3) a codiol with 4 to 10 carbon atoms in which the hydroxyl groups are separated by a branched or unbranched alkylene group with 3 or 4 carbon atoms wherein said codiol,

(a) carries at least one secondary or tertiary hydroxyl group; or

(b) carries two primary hydroxyl groups and is unsubstituted, monoalkyl-substituted or dialkyl-substituted with the sum of the carbon atoms of the substituents being at least 4; and

(B) said process comprising the steps of

(1) feeding 100 parts of a polyethylene terephthalate segment having an intrinsic viscosity of at least 0.2 dl/g (at 25° in 1:1 phenol/tetrachloroethane) per 0.23 to 9.1 parts of codiol and an appropriate amount of transesterification catalyst to a screw machine;

(2) operating the screw machine so as to homogenize the melt of these components; and

(3) subjecting the recovered solidified product to a solid-state post-condensation treatment at between about 200° C. and the softening point of the copolymer.

## 4,314,929
## MINERAL REINFORCED POLYAMIDES

**John J. Mahoney, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Feb. 11, 1981, Ser. No. 233,486**

**Int. Cl.³ C08K *9/06***

**U.S. Cl. 260—42.15** **8 Claims**

1. A polymeric composition consisting essentially of:

A. 50 to 80 weight percent of a polyamide selected from polyhexamethylene adipamide or polycaprolactam or mixtures thereof, said polyamide having a number average molecular weight in the range of 10 to 30,000;

B. 20 to 40 weight percent finely divided calcined aluminum silicate coated with 0.5 to 2% by weight of an aminofunctional silane, said silicate having a $D_{50}$ particle size in the range of 0.8 to 1.2 micrometers;

C. 5 to 15 weight percent of a copolymer which is comprised of units of an α-olefin having the formula $R—CH=CH_2$, where R is a radical selected from the class consisting of hydrogen and alkyl radicals having from 1 to 8 carbon atoms, and units of one or more α,β-ethylenically unsaturated monocarboxylic acids having from 3 to 8 carbon atoms, said copolymer having from 0% to 90% of the carboxylic acid groups ionized by neutralization with metal ions uniformly distributed throughout the copolymer, and where unneutralized carboxyl groups of the carboxylic acid units can be esterified with a $C_1$–$C_6$ alkyl alcohol, said copolymer being a direct copolymer of the α-olefins and the unsaturated monocarboxylic acid in which the carboxylic acid groups are randomly distributed and in which (1) the α-olefin content of the copolymer is at least 50 mol percent, based on the α-olefin/unsaturated monocarboxylic acid copolymer, (2) the unsaturated monocarboxylic acid content of the copolymer is from 0.2 to 25 mol percent, based on the α-olefin-acid copolymer, and (3) any other monomer component optionally copolymerized in said copolymer is monoethylenically unsaturated, and said metal ions having an ionized valence of from one to three inclusive and said metal ions being selected from the group consisting of uncomplexed and complexed metal ions.

## 4,314,930
## COMPOSITION CONTAINING A HALF ESTER OF AN ORGANIC POLYOL, AN UNSATURATED MONOMER, AN EPOXIDE, AND REINFORCING FIBER

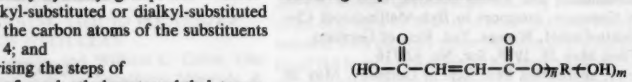
**Hugh C. Gardner, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 147,098, May 7, 1980, abandoned, which is a continuation of Ser. No. 70,007, Aug. 27, 1979, abandoned. This application Jul. 22, 1980, Ser. No. 167,884**

**Int. Cl.³ C08L *63/10***

**U.S. Cl. 260—42.18** **18 Claims**

1. A curable molding composition having a cure time of 25 minutes or less comprising (a) a half ester characterized by the following empirical formula:



(I)

wherein n is a number having an average value of about 1.5 to less than about 4, m is equal to the free valence of R less the average value of n, R is the hydroxyl-free residue of an organic polyol which contained from 2 to 4 inclusive, hydroxyl groups, OH, in formula (I), (b) maleic anhydride, (c) an epoxide containing two or more 1,2-epoxide radicals, (d) an ethylenically unsaturated monomer which forms a liquid homogeneous mixture with the half ester, maleic anhydride and the epoxide, (e) from about 15 to about 80 weight percent of one or more reinforcing fibers having a melting point or a glass transition temperature above about 130° C. and (f) an epoxide curing catalyst.

## 4,314,931
## TONER PIGMENT TREATMENT PROCESS FOR REDUCING THE RESIDUAL STYRENE MONOMER CONCENTRATION TO LESS THAN 0.5 PERCENT BY WEIGHT

**Thomas R. Hoffend, Webster, N.Y., and Moshe Levy, Rehovot, Israel, assignors to Xerox Corporation, Stamford, Conn.**

**Filed Jun. 9, 1980, Ser. No. 157,904**

**Int. Cl.³ C08J *3/20*; C08K *3/04***

**U.S. Cl. 260—42.53** **4 Claims**

1. An improved process for reducing the styrene monomer concentration in toner compositions to less than 0.5 percent by weight, which comprises (1) mixing from about 20 percent to about 99 percent by weight of styrene and n-butylmethacrylate monomers containing from about 0.5 percent to about 20 weight percent of a free radical initiator, with from about 1 percent to about 80 percent of pigment, (2) heating the resultant mixture to a temperature of about 50° C. to about 120° C., such heating being accomplished for a sufficient period of time so as to cause polymerization, (3) cooling to room temperature, and (4) separating the styrene/n-butylmethacrylate copolymer pigment mixture from the reaction residue, which mixture contains on the pigment surface said styrene/n-butylmethacrylate copolymer.

4,314,932

## FINE SPHERICAL POLYMER PARTICLES CONTAINING INORGANIC PIGMENT AND/OR COLORING AGENT AND PROCESS FOR THE PREPARATION THEREOF

Saburo Wakimoto, Hayama; Sadayasu Miyahara, Fujisawa, and Yoshihiko Hyosu, Sagamihara, all of Japan, assignors to Sinloihi Company Limited, Osaka, Japan

Continuation-in-part of Ser. No. 57,344, Jul. 13, 1979, Pat. No. 4,269,760. This application Aug. 18, 1980, Ser. No. 178,930

Claims priority, application Japan, Jul. 7, 1978, 53-81949; Jul. 7, 1978, 53-81950; Nov. 9, 1978, 53-137337; Nov. 9, 1978, 53-137338

The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.

Int. Cl.[3] C08J *3/20*

U.S. Cl. 260—42.53 5 Claims

1. Fine spherical polymer particles with a uniform particle size distribution containing at least one member selected from the group of inorganic pigments and black coloring agents, which comprise polymerized products from at least one polymerizable monomer and an inorganic dispersion stabilizer in which said polymerizable monomer is charged with cation or anion and said inorganic dispersion stabilizer has an opposite charge to said monomer, said polymerizable monomer is a member selected from the group consisting of trimethylolpropane triacrylate, trimethylolethane triacrylate and tetramethylolmethane tetracrylate, the surface of said polymer particles being firmly bound through ionic bond to and being completely covered with said inorganic dispersion stabilizer.

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4,314,933

## METHOD FOR LIGHT STABILIZATION OF TWO-LAYER UNI-LACQUER COATINGS

Godwin Berner, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 4, 1980, Ser. No. 118,253

Claims priority, application Switzerland, Feb. 15, 1979, 1484/79

Int. Cl.[3] C08K *5/34, 5/36;* B32B *15/08*

U.S. Cl. 260—45.75 N 17 Claims

1. A method for stabilizing two-layer uni-lacquer coatings based on acrylic, alkyd or polyester resins, melamine/formaldehyde resins, epoxide resins or polyisocyanates against the adverse effects of light, humidity and oxygen which comprises incorporating in said resin (1)a 2,2,6,6-tetraalkylpiperidine compound, its acid addition salts or metal complexes, and (2)a second ultra-violet light absorbing compound; said components (1) and (2) being present in a total concentration of from about 0.02 to 5.0%, by weight of the resin components.

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4,314,934

## ORGANOHALIDE POLYMERS STABILIZED WITH AN ORGANOTIN COMPOUND AND AN ORTHO MERCAPTO PHENOL COMPOUND

Kenneth V. Smith, Cincinnati, Ohio, and Jack D. Taylor, Katy, Tex., assignors to Carstab Corporation, Reading, Ohio

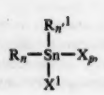
Filed Feb. 26, 1981, Ser. No. 238,506

Int. Cl.[3] C08K *5/58*

U.S. Cl. 260—45.75 S 17 Claims

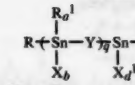
1. A stabilizer composition comprising:

A. an organic tin compound or mixture of organic tin compounds selected from compounds having the formulas:

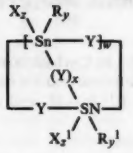


(I)

-continued



(II)



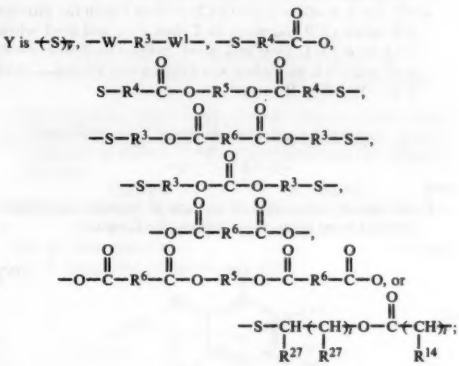
(III)

wherein

X and $X^1$ are the same or different and are selected from $-SR^2$, Cl, Br, I,

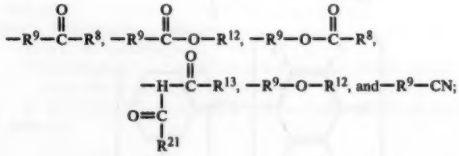
and $O-R^8$ with the proviso that in formula (III) when z=1 and in formulas (I) and (II) at least one X or $X^1$ is $-SR^2$;

Y is

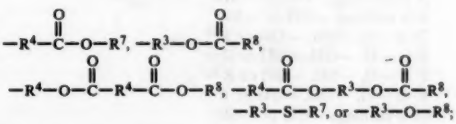


W and $W^1$ are the same or different and are oxygen or sulfur;

R and $R^1$ are the same or different and are selected from alkyl, aryl, alkenyl, aralkyl, alkaryl, cycloalkyl, cycloalkenyl,



$R^2$ is alkyl, alkenyl, aryl, hydroxy-substituted aryl, aralkyl, cycloalkyl, cycloalkenyl,



$R^3$ is alkylene of at least 2 carbon atoms, arylene, alkenylene of at least 2 carbon atoms, cycloalkylene, or cycloalkenylene;

$R^4$ is alkylene, arylene, alkenylene of at least 2 carbon atoms, cycloalkylene, or cycloalkenylene;
$R^5$ is $R^3$;
$R^6$ is nothing or $R^4$;
$R^7$ is —H or $R^8$;
$R^8$ is alkyl, alkenyl, aryl, aralkyl, alkaryl, cycloalkyl, or cycloalkenyl;
$R^9$ is $C_1$ to $C_4$ alkylene;
$R^{12}$ is —H or a monovalent $C_1$ to $C_{20}$ hydrocarbon radical;
$R^{13}$ and $R^{21}$ are the same or different and are each $C_1$ to $C_{20}$ alkyl or $C_1$ to $C_{20}$ alkoxy; $R^{14}$ is —H, aryl or $C_1$ to $C_{18}$ alkyl;

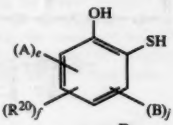
$R^{27}$ is $-\overset{O}{\overset{\|}{C}}-O-R^{16}$, $-O-\overset{O}{\overset{\|}{C}}-R^{16}$, —OH, —SH, aryl, $C_1$ to $C_{18}$ alkyl or —H; $R^{16}$ = H or $R^8$;

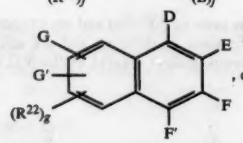
i=0 or an integer from 1 to 6 inclusive;
n=0, 1 or 2, n'=0, 1 or 2 and p=1 or 2 with the proviso that n+n'=1 or 2 and n+n'+p=3; a=0, 1 or 2, b=0, 1 or 2, q=1 to 5, c=1, 2 or 3 and d=0, 1 or 2 with the proviso that a+b=2 and c+d=3;
v=an integer from 1 to 8 inclusive; and
w=0, 1 or 2, x=0 or 1, y=1 or 2, z=0 or 1 with the proviso that when x=0 and w=1 or 2 then y=1 and z=1 when x=1 then y=1, z=0 and w=1, when w=2 then x=0, y=1 and z=1, and when w=0 then x=0, y=1, z=1 and Y is —W—$R^3$—$W^1$— or

$$-S-R^4-\overset{O}{\overset{\|}{C}}-O-;$$

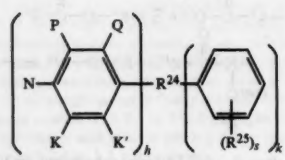
and

B. an organic compound or mixture of organic compounds selected from compounds having the formulas:

(IV)



(V)


, or

(VI)



wherein
A is nothing, —OH or —SH,
B is nothing, —OH or —SH
D is —H, —SH, —OH or $R^{26}$
E is —H, —OH, —SH or $R^{26}$
F is —H, —SH, —OH or $R^{26}$
F' is —H, —OH, —SH or $R^{26}$
G is nothing, —OH or —SH
G' is nothing, —SH or —OH
K is —H, —SH, —OH or $R^{23}$
K' is —H, —OH, —SH or $R^{23}$
N is —H, —SH, —OH or $R^{23}$
P is —H, —SH, —OH or $R^{23}$
Q is —H, —SH, —OH or $R^{23}$
$R^{20}$ is nothing, alkyl, aryl, alkenyl, alkaryl, cycloalkyl, alkoxy or halogen,
$R^{26}$ is alkyl, alkenyl or halogen
$R^{22}$ is alkyl, alkenyl or halogen
$R^{23}$ is alkyl, alkenyl or halogen
$R^{24}$ is alkylene or alkenylene
$R^{25}$ is alkyl, alkenyl, halogen, —SH or —OH
e is 0 to 2
j is 0 to 2
f is 0 to 3
s is 0 to 3
g is 0 to 3
h is 1 to 4
k is 0 to 3
h+k is 2 to 4
e+j+f is 0 to 4
with the proviso that (1) in formula (V) two of groups D, E, F and F' must be an OH group and an SH group bonded directly to adjacent ring carbon atoms, and (2) in formula (VI) two of groups K, K', N, P and Q must be an OH group and an SH group bonded directly to adjacent ring carbon atoms.

16. A polymer composition comprising a halogen-containing organic polymer normally susceptible to heat induced deterioration and a stabilizingly effective amount of a stabilizer composition according to claim 1.

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**4,314,935**

## PROCESS FOR RECOVERING INTERFERON

**Yahiro Uemura, Hirakata; Hirofumi Arimura, Toyonaka; Hiroshi Morise, Hirakata; Satoshi Funakoshi, Katano, and Tadakazu Suyama, Kyoto, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan**

**Filed Aug. 6, 1980, Ser. No. 175,744**
**Claims priority, application Japan, Oct. 5, 1979, 54-128513**
**Int. Cl.³ A61K *45/02*; C07G *7/00***
**U.S. Cl. 260—112 R** **7 Claims**

1. A process for recovering interferon, which comprises contacting a solution containing interferon produced by the induced cells of human origin with a water-insolubilized heparin to allow the interferon to be adsorbed on the water-insolubilized heparin and then eluting the interferon with an aqueous solution of an inorganic salt.

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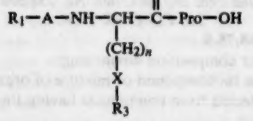
**4,314,936**

## SUBSTRATES FOR THE QUANTITATIVE ASSAY OF ENZYMES AND SUCH ASSAY

**Arieh Yaron, and Amos Carmel, both of Rehovot, Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel**

**Continuation-in-part of Ser. No. 48,260, Jun. 13, 1979, abandoned. This application Dec. 1, 1980, Ser. No. 211,794**
**Claims priority, application Israel, Jun. 16, 1978, 54940; Aug. 21, 1980, 60888**
**Int. Cl.³ C07C *103/52*; C12Q *1/36***
**U.S. Cl. 260—112.5 R** **19 Claims**

1. Substrate with high susceptibility to peptidyldipeptide hydrolases (E.C. 3.4.15), especially angiotensin-converting enzyme, which substrates are represented by the formula

(I)



or salts thereof, where $R_1$ is selected from the group consisting of 1-diemthylaminonaphtalene-5-sulfonyl, 2-aminobenzoyl, 1.8-aminonaphtalenesulfonyl, anthracene-9-carbonyl, fluoresceinyl, tetrabromofluoresceinyl ("eosinyl"), and rhodaminyl;

A is selected from the group consisting of glycyl, L-alanyl, L-leucyl, L-phenylalanyl and L-isoleucyl; n is 1–6; X is selected from the group consisting of a single bond, a carbonyl and imine (NH) group; $R_3$ is selected from the group consisting of nitrophenyl, dinitrophenyl, trinitrophenyl, nitrobenzyloxycarbonyl, dinitrobenzyloxycarbonyl, trinitrobenzyloxycarbonyl, nitrobenzoyl, dinitrobenzoyl, trinitrobenzoyl, ω-nitrophenylalkylamine having 1–4 carbon atoms in a straight chain, ω-dinitrophenylalkylamine having 1–4 carbon atoms in a straight chain and ω-trinitrophenylalkylamine having 1–4 carbon atoms in a straight chain.

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**4,314,937**

## 1:2 CHROMIUM UNSYMMETRICAL COMPLEXES OF AZO AND DISAZO DYES

**Fabio Beffa, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

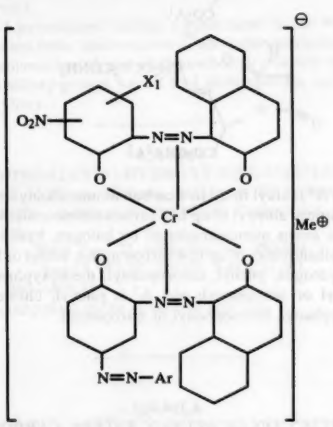
**Continuation-in-part of Ser. No. 924,316, Jul. 13, 1978, abandoned, which is a continuation of Ser. No. 762,062, Jan. 24, 1977, abandoned. This application Mar. 7, 1980, Ser. No. 128,228**

**Claims priority, application Switzerland, Feb. 4, 1976, 1356/76**

**Int. Cl.³ C09B 45/06, 45/26, 45/48; D06P 3/32**

**U.S. Cl. 260—145 A** **3 Claims**

1. A chromium complex dye of the formula



wherein

$X_1$ is hydrogen, chloro, nitro or methyl;

$Me^{\oplus}$ is a cation; and

Ar is phenyl or naphthyl which is substituted by one or two $-SO_3H$ and is further unsubstituted or substituted by $C_1$–$C_5$ alkyl, $C_1$–$C_2$ alkoxy, chloro or nitro.

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**4,314,938**

## IMINOISOINDOLINONE PIGMENTS CONTAINING PHENYLAZOACETOACETYL-AMINOPHENYLENE GROUPS

**Ernst Model, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

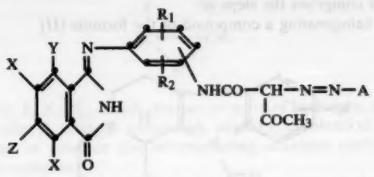
**Filed Jun. 11, 1980, Ser. No. 158,555**

**Claims priority, application Switzerland, Jun. 19, 1979, 5709/79**

**Int. Cl.³ C09B 43/00, 43/11, 43/32, 43/44**

**U.S. Cl. 260—165** **7 Claims**

1. An iminoisoindolinone pigment of the formula



wherein X is halogen, Y and Z are halogen, $C_1$–$C_4$ alkoxy or aryloxy, $R_1$ and $R_2$ are hydrogen, halogen, $C_1$–$C_2$ alkyl or $C_1$–$C_2$ alkoxy, and A is phenyl; phenyl substituted by halogen, by trifluoromethyl, by $C_1$–$C_2$ alkyl, by $C_1$–$C_2$ alkoxy or by a group of the formula $-CONHR_3$ or $-NHCOR_4$, wherein $R_3$ is hydrogen, $C_1$–$C_2$ alkyl, phenyl or phenyl substituted by halogen, by methyl, by methoxy or by trifluoromethyl, and $R_4$ is $C_1$–$C_2$ alkyl, phenyl or phenyl substituted by halogen, by methyl or by methoxy; or A is benzimidazolonyl, N-methylbenzimidazolonyl, chlorobenzimidazolonyl, methylbenzimidazolonyl, methoxybenzimidazolonyl, phenmorpholonyl, 6-methylphenmorpholonyl, quinazolinyl, 2,4-dihydroxy-1,3-quinazolinyl, quinolonyl, methylquinolonyl or quinazolonyl.

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**4,314,939**

## PROCESS FOR THE PREPARATION OF 15-HYDROXYIMINO-E-HOMOEBURNANE AND INTERMEDIATES THEREFOR

**Csaba Szantay; Lajos Szabo; György Kalaus; Lajos Dancsi; Tibor Keve, and Ferenc Drexler, all of Budapest, Hungary, assignors to Richter Gedeon Vegyészeti Gyár Rt., Budapest, Hungary**

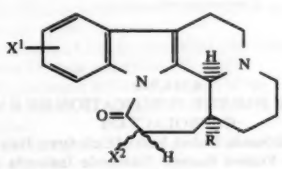
**Filed Jul. 14, 1980, Ser. No. 168,560**

**Claims priority, application Hungary, Jul. 13, 1979, RI 719**

**Int. Cl.³ C07D 471/22; A61K 31/55**

**U.S. Cl. 260—239.3 P** **27 Claims**

1. A compound of the formula (III)



(III)

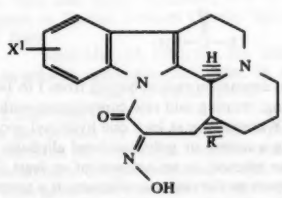
wherein

$X^1$ is hydrogen or halogen,

R is $C_1$ to $C_6$ alkyl, and

$X^2$ is halogen, or a 15-epimer or a pharmaceutically acceptable acid addition salt thereof.

3. A process for the preparation of a compound of the formula (I)



(I)

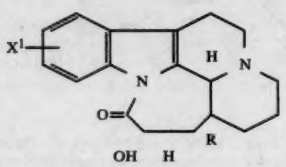
wherein

$X^1$ is hydrogen or halogen, and

R is $C_1$ to $C_6$ alkyl,

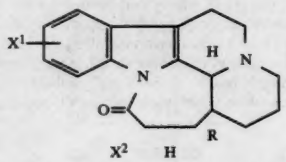
or a pharmaceutically acceptable acid additon salt thereof which comprises the steps of:

(a) halogenating a compound of the formula (II)



(II)

or a 15-epimer of a pharmaceutically acceptable acid addition salt thereof, to produce a compound of the formula (III)



(III)

or a 14-epimer of a pharmaceutically acceptable acid addition salt thereof wherein $X^2$ is halogen;

(b) oximating the compound of the formula (III) with an alkali nitrite in the presence of an acid to prepare the compoundd of the formula (I); and

(c) in the case where a pharmaceutically acceptable acid addition salt of the compound of the formula (I) is prepared, converting the compound of formula (I) to a pharmaceutically acceptable acid addition salt.

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**4,314,940**

## METHOD FOR THE PURIFICATION OF RAW CAPROLACTAM

**Paolo Senni, and Nando Toderi, both of Colleferro, Italy, assignors to SNIA Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy**

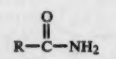
**Filed Apr. 21, 1980, Ser. No. 142,860**

**Claims priority, application Italy, Apr. 30, 1979, 22250 A/79**

**Int. Cl.³ C07D *201/16***

**U.S. Cl. 260—239.3 A** **10 Claims**

1. A method for the purification of raw caprolactam which contains as impurities one or more primary amides having the formula I



(I)

wherein R is a hydrocarbon radical having from 1 to 14 carbon atoms, comprising, treating said raw caprolactam with at least one compound Y containing at least one hydroxyl group, said compound being a mono- or polyfunctional aliphatic or aromatic alcohol or phenol, in an amount of at least 20% by weight with respect to the raw caprolactam, at a temperature equal to or higher than that at which said primary amide of Formula I reacts with compound Y to form ammonia, maintaining said temperature for a sufficient time for said reaction to near completion; and separating said caprolactam.

**4,314,941**

## AMINOCARBONYLMETHYL ETHERS OF CLAVULANIC ACID, A PROCESS FOR THEIR PREPARATION AND USE

**Brian C. Gasson, Redhill, England, assignor to Beecham Group Limited, England**

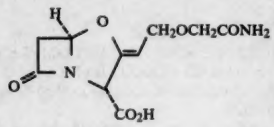
**Filed Dec. 26, 1978, Ser. No. 973,749**

**Claims priority, application United Kingdom, Jan. 26, 1978, 03129/78**

**Int. Cl.³ C07D *498/04;* A61K *31/42***

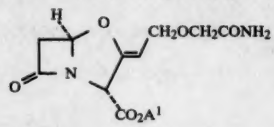
**U.S. Cl. 260—245.3** **13 Claims**

1. The compound of the formula (I):



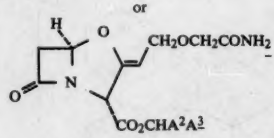
(I)

a pharmaceutically acceptable salt thereof or an ester thereof of the formula (II) or (III):



(II)

or



(III)

wherein $A^1$ is alkyl of up to 4 carbon atoms, alkenyl of up to 4 carbon atoms, alkynyl of up to 4 carbon atoms or alkyl of up to 4 carbon atoms mono-substituted by halogen, hydroxyl, alkoxyl or alkanoyloxy of up to 4 carbon atoms, acetyl or benzoyl; $A^2$ is hydrogen, phenyl, chlorophenyl, methoxyphenyl, bromophenyl or nitrophenyl; and $A^3$ is phenyl, chlorophenyl, methoxyphenyl, bromophenyl or nitrophenyl.

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**4,314,942**

## DEPROTECTION OF ALLYLIC ESTERS, CARBONATES AND CARBAMATES CATALYZED BY PALLADIUM COMPOUNDS

**Stuart W. McCombie, West Orange, N.J., assignor to Schering Corporation, Kenilworth, N.J.**

**Filed Jan. 10, 1979, Ser. No. 2,472**

**Int. Cl.³ C07D *501/04, 499/04***

**U.S. Cl. 260—245.2 R** **12 Claims**

1. A process for the removal of an allyl group in an allylic ester formed from a carboxylic acid and an allylic alcohol or derivative thereof or an allyloxycarbonyl group in an allylic carbonate or allylic carbamate formed from an alcohol or amine and an allylic alcohol chloroformate or allylic alcohol activated ester, which comprises:

reaction of a solution of the allylic ester, carbonate or carbamate in an organic, non-hydroxylic solvent with 2-ethylhexanoic acid, or an alkali metal salt thereof, and a catalytic amount of an organic-soluble palladium complex having a corrdinating phosphine ligand, said catalytic amount of palladium complex being from about 0.25 to about 5 molar percent of said allylic ester, cabonate or carbamate, respectively.

4,314,943

## HETEROCYCLIC SUBSTITUTED ARYLOXY 3-INDOLYL-TERTIARY BUTYLAMINOPROPANOLS

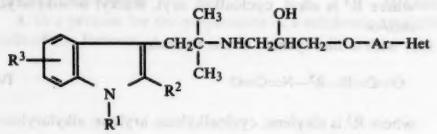
William E. Kreighbaum, and William T. Comer, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Continuation-in-part of Ser. No. 815,138, Jul. 13, 1977, abandoned. This application Feb. 13, 1979, Ser. No. 11,819

Int. Cl.[3] A61K *31/40;* C07D *209/14*

U.S. Cl. 260—326.13 B 5 Claims

1. A compound selected from the group consisting of



and the acid addition salts thereof wherein

$R^1$ or $R^2$ is hydrogen and the other is hydrogen or alkyl having 1 to 4 carbon atoms,

$R^3$ is H, halogen, alkyl having 1 to 4 carbon atoms, or alkoxy having 1 to 4 carbon atoms and is located in the 4-, 5-, 6-, or 7-positions of the indole ring,

Ar is phenylene,

Het is an Ar-attached heterocyclic substituent selected from the group consisting of

1-pyrrolyl,

2-oxo-1-pyrrolidinyl having a substituent in the 4-position selected from aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, and alkoxycarbonyl, wherein said alkyl and alkoxy groups have 1 to 4 carbon atoms, and

furfuryloxy.

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4,314,944

## 4-AMINOALKYL-7-HYDROXY-2(3H)-INDOLONES

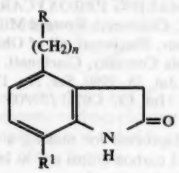
William F. Huffman, Malvern, and James W. Wilson, Wayne, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Aug. 22, 1980, Ser. No. 180,551

Int. Cl.[3] C07D *209/14;* A61K *31/40*

U.S. Cl. 260—326.15 9 Claims

1. A compound of the structural formula:



in which R is amino, lower alkylamino, di-loweralkylamino, di-N-allylamino or N-allyl-N-lower alkylamino, $R^1$ is hydroxy or methoxy and n is an integer from 1-3; together with the pharmaceutically acceptable acid addition salts thereof.

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4,314,945

## ALKYLENE CARBONATE PROCESS

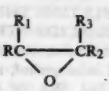
Charles H. McMullen, Katonah, N.Y.; James R. Nelson, S. Charleston, W. Va.; Bernard C. Ream, Charleston, W. Va., and Joseph A. Sims, Jr., Elkview, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 22, 1977, Ser. No. 863,354

Int. Cl.[3] C07D *317/36, 317/38*

U.S. Cl. 260—340.2 13 Claims

1. A process for producing alkylene carbonate by the reaction of carbon dioxide and an alkylene oxide of the formula



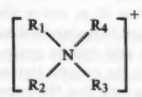
wherein R, $R_1$, $R_2$, and $R_3$ are one or more of hydrogen, alkyl, aryl, alkaryl, aralkyl, cycloalkyl, allyloxy, chloroalkyl, and aryloxy to produce the corresponding alkylene carbonate which comprises:

(a) providing a homogeneous liquid phase reaction zone in which the predominant material therein is the alkylene carbonate, said alkylene carbonate employed in an amount of from about 85 to about 99.6 weight percent, based on the weight of material within the reaction zone;

(b) providing a catalytic amount of an alkylene oxide carbonation catalyst to said liquid phase, said catalyst a salt characterized by the following formula:

$$M^+ A^-$$

wherein M is potassium or a quaternary ammonium cation of the following formula:



wherein $R_1$, $R_2$, $R_3$ and $R_4$ may each be alkyl, aryl, alkenyl, alkaryl, or aralkyl including substituents thereon in any combination or in which any two or more of the radicals $R_1$, $R_2$, $R_3$ and $R_4$ may be interconnected to form with the basic nitrogen atom a ring of the pyridine, piperidine, quinuclidine, pyrrolidine, pyrroline, morpholine, or thiomorpholine derivatives and 1,4-diazobicyclo[2.2.2]octane, A is bromine, chlorine, or iodine when M is quaternary ammonium cation and is iodine when M is potassium;

(c) having dissolved in said liquid phase sufficient $CO_2$ to provide a molal amount therein which exceeds the molal amount of the catalyst;

(d) providing a $CO_2$ pressure in the reaction zone of between about 150 psig and about 750 psig;

(e) maintaining a sufficient amount of the alkylene oxide in the reaction to maintain the pressure and temperature thereof;

(f) maintaining the reaction zone at a temperature at which the alkylene oxide and $CO_2$ react to form alkylene carbonate, which temperature is not greater than 200° C.; and

(g) correlating the reaction zone temperature and pressure to yield an alkylene carbon efficiency of at least about 99% and a conversion of at least about 99.5%.

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4,314,946

## PROCESS FOR THE CONTINUOUS SEPARATION OF MALEIC ANHYDRIDE FROM PROCESS GASES

Amleto Neri, and Sergio Sanchioni, both of Bergamo, Italy, assignors to Ftalital Prodotti Chimici Speciali S.p.A., Mailand, Italy

Filed Mar. 14, 1980, Ser. No. 130,440

Claims priority, application Italy, Mar. 20, 1979, 48436 A/79

Int. Cl.[3] C07D *307/60*

U.S. Cl. 260—346.76 4 Claims

1. In the process for the continuous separation of maleic anhydride from the process gas from the catalytic oxidation of a hydrocarbon in the gaseous phase, which comprises treating the process gases with a solvent, the improvement comprising said solvent being a dialkyl ester, having 4 to 8 carbons in each alkyl group, of hexahydrophthalic acid, tetrahydrophthalic acid, methyltetrahydrophthalic acid or methylhexahydrophthalic acid.

4,314,947

## PROCESS FOR COMPLETING THE ESTERIFICATION OF CARBOXYLIC ACIDS WITH ALCOHOLS

Heinz Hohenschutz, Mannheim; Josef Gnad, Ludwigshafen; Güenter Dinkhauser, Limburgerhof, and Eberhard Schaefer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 21, 1978, Ser. No. 971,662

Int. Cl.³ C07C *67/08, 67/54*

U.S. Cl. 260—410 4 Claims

1. A continuous process for completing the esterification of aliphatic carboxylic acids of 1 to 8 carbon atoms with aliphatic or cycloaliphatic alcohols of 3 to 10 carbon atoms by treating a pre-esterified reaction mixture which in addition to the carboxylic acid ester already formed contains as yet unconverted proportions of carboxylic acid and alcohol, together with an esterifying catalyst and water of reaction, and with or without an entraining agent, at the boiling point of the alcohol or of the entraining agent, in a column operated with bottom heating, the water of esterification being driven off at the top of the column by azeotropic distillation, wherein the lower space of the column is free from fitments, the middle space of the column is provided with a packing and the upper space of the column is provided with a packing or other fitments, the starting pre-esterified reaction mixture is fed into the middle space of the column from 5 to 10 m above the upper liquid level, which upper liquid level is maintained within the lower portion of the packing in said middle space, the ester formed is taken off as liquid from the column bottom, and the column is operated with flooding such that the upper liquid level is from 6 to 10 m above the bottom of said lower space, with the liquid mixture filling said lower space and said lower portion of said packing in said middle space.

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4,314,948

## PREPARATION OF MIXTURES OF 1-MONOHALOGENATED ISOCYANATES AND 1,2-UNSATURATED ISOCYANATES

Karl-Heinz Koenig, Frankenthal; Karl-Heinz Feuerherd, and Heinz-Guenter Oeser, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

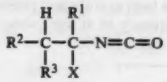
Filed Aug. 5, 1980, Ser. No. 175,592

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1979, 2937028

Int. Cl.³ C07C *118/00, 119/042, 119/045, 119/048*

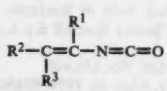
U.S. Cl. 260—453 P 10 Claims

1. A process for the preparation of a mixture of 1-monohalogenated isocyanates of the formula



Ia

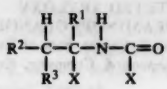
and 1,2-unsaturated isocyanates of the formula



Ib

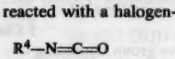
where $R^1$, $R^2$ and $R^3$ may be identical or different and each is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl, or the pair of radicals $R^1$ and $R^2$ together with the two adjacent carbon atoms, or the pair of radicals $R^2$ and $R^3$ together with the adjacent carbon atom, can also form members of a 5-membered or 6-membered alicyclic ring, $R^1$, $R^2$ and $R^3$ in total contain up to 8 carbon atoms, and X is chlorine or bromine, wherein

(a1) 1-monohalogenated carbamic acid halides of the formula



II

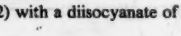
where $R^1$, $R^2$, $R^3$ and X have the above meanings, are reacted with a halogen-free isocyanate of the formula



III

where $R^4$ is alkyl, cycloalkyl, aryl, aralkyl or alkylaryl, and/or

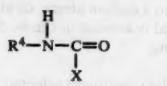
(a2) with a diisocyanate of the formula



IV

where $R^5$ is alkylene, cycloalkylene, arylene, alkylarylene or arylalkylene, or

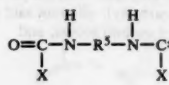
(b1) 1,2-unsaturated isocyanates Ib are reacted with a 1-halogen-free carbamic acid halide of the formula



V

where $R^4$ and X have the above meanings and/or

(b2) with a bis-carbamic acid halide of the formula



VI

where $R^5$ and X have the above meanings, and/or

(b3) with a 1-monohalogenated carbamic acid halide II or

(c1) 1-monohalogenated isocyanates Ia are reacted with a halogen-free isocyanate III and/or

(c2) with a diisocyanate IV.

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4,314,949

## PROCESS FOR MAKING PEROXYCARBOXYLIC ACIDS

Griscom Bettle, III, Cincinnati; Howard Mills, Forest Park, and Edward B. Richter, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 23, 1980, Ser. No. 171,564

Int. Cl.³ C07C *179/00*

U.S. Cl. 260—502 R 7 Claims

1. An improved process for making a peroxyacid having about 6 to about 18 carbon atoms and at least one peroxyacid moiety, comprising the step of:

(a) preparing a reaction slurry comprising a liquid phase and a solid phase;

i. said liquid phase comprising 60 to 80% by weight of the mixture of concentrated acid selected from the group consisting of sulfuric acid, methane sulfuric acid, phosphonic acid, phosphoric acid, pyrophosphonic acid, and mixtures thereof; 2.5 to 12.5% by weight of the mixture of hydrogen peroxide; and 7.5 to 37.5% by weight of the mixture of water, and

ii. said solid phase comprising a peroxyacid having about 6 to about 18 carbon atoms and the carboxylic acid starting material corresponding to said peroxyacid;

in a reaction vessel at a temperature between about 15 degrees Celsius and 50 degrees Celsius; the ratio of the liquid phase to the solid phase being from about 15:1 to about 49:1.

4,314,950

## PROCESS FOR THE PREPARATION OF SULPHONIC ACID CHLORIDES

Theodor Pfister, Wuppertal; Wolfgang Schenk, Leverkusen, and Heinz U. Blank, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

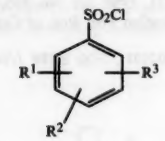
Continuation of Ser. No. 944,457, Sep. 21, 1978, abandoned. This application May 5, 1980, Ser. No. 146,827

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1977, 2743541

Int. Cl.³ C07C *143/26*

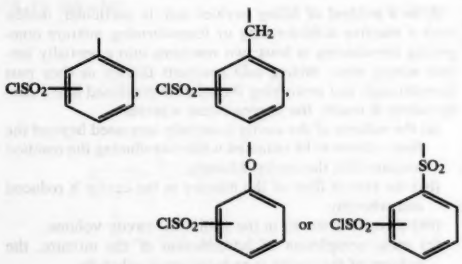
U.S. Cl. 260—543 R 16 Claims

1. In a process for the preparation of a sulphonic acid chloride of the formula

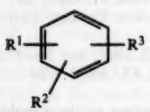


(I)

wherein $R^1$, $R^2$ and $R^3$ are identical or different and denote hydrogen, a lower alkyl radical or a cycloalkyl radical, halogen, aryl, aralkyl, aryl ether or a radical $—SO_2Cl$, $—SO_2$-aryl



or wherein adjacent radicals $R^1$ and $R^2$ are linked to form a cycloaliphatic or aromatic carbocyclic ring which is optionally substituted by a sulphonic acid chloride group, contacting an aromatic compound of the formula



(II)

wherein $R^1$, $R^2$ and $R^3$ have the above-described meanings with chlorosulphonic acid and phosgene, the improvement which comprises contacting said aromatic compound with chlorosulphonic acid initially and thereafter contacting the resultant reaction product with phosgene in the presence of a catalyst.

4,314,951

## MIXTURE PREPARATION APPARATUS

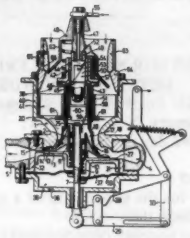
Siegfried Holzbaur, and Konrad Eckert, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 14,200, Feb. 22, 1979, Pat. No. 4,263,235. This application Jul. 21, 1980, Ser. No. 170,388

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1978, 2807465

Int. Cl.³ F02M *17/16*

U.S. Cl. 261—44 D 25 Claims



1. A mixture preparation apparatus for mixture-compressing, externally ignited internal combustion engines having a throttle device and an air intake line, an air flow rate meter and a rotatable vane body in said air intake line, said rotatable vane body provided with a plurality of scoops, said scoops arranged to extend into a contoured section of the intake side of an annular flow channel and spaced therefrom in an axial direction during increased air quantities and means upstream of the vane body for introducing fuel into said air intake line, further wherein said scoops are configured to cooperate with said annular flow channel and means for arbitrarily controlling air-fuel mixture to said annular flow channel and therefrom to said engine.

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4,314,952

## PROCESS OF PREPARING SINTERED URANDIUM DIOXIDE PELLETS

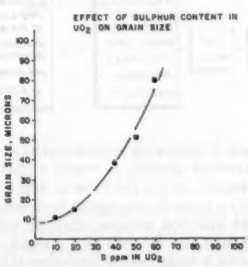
Tadeusz W. Zawidzki, Ottawa, Canada, assignor to Eldorado Nuclear Limited, Canada

Filed Apr. 23, 1979, Ser. No. 32,693

Claims priority, application United Kingdom, Apr. 28, 1978, 17091/78

Int. Cl.³ G21C *21/00*

U.S. Cl. 264—0.5 7 Claims




1. A process for the preparation of a sintered, high density, large grain size uranium dioxide pellet which comprises the steps of:

(i) reacting a uranyl nitrate of formula $UO_2(NO_3)_2.6H_2O$ with a sulphur source, at a temperature of from about 300°

C. to about 400° C. to provide a sulphur containing uranium trioxide;

(ii) reacting the thus-obtained modified uranium trioxide with ammonium nitrate to form an insoluble sulphur-containing ammonium uranate;

(iii) neutralizing the thus-formed slurry with ammonium hydroxide to precipitate out as an insoluble ammonium uranate the remaining dissolved uranium;

(iv) recovering the thus formed precipitates in a dry state;

(v) reducing the dry precipitate to $UO_2$, and forming it into "green" pellets; and

(vi) sintering the thus obtained pellets in a hydrogen atmosphere and at an elevated temperature.

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**4,314,953**

## PROCESS FOR REDUCING FRIABILITY OF DETERGENT POWDERS

**Peter C. Knight, South Wirral, England, assignor to Lever Brothers Company, New York, N.Y.**

**Filed Jun. 13, 1980, Ser. No. 159,030**
**Int. Cl.³ B01J *2/02***
**U.S. Cl. 264—13** **2 Claims**

1. A process for the production of a spray-dried detergent powder comprising the steps of:

(a) forming an aqueous crutcher slurry comprising

(i) from 10–35% by weight, based on the weight of the spray-dried powder, of a detergent active compound;

(ii) a detergency builder compound in an amount of from 10–35% by weight, based on the weight of the spray dried powder, provided that when a phosphate-containing detergency builder is present it is present in an amount of from 10–20% by weight, based on the weight of the spray-dried powder;

(iii) at least 5% by weight, based on the weight of the spray dried powder, of a sodium silicate; and

(iv) a hydrated starch in an amount of from about 1 to 5% by weight, based on the weight of the spray dried powder;

and

(b) spray drying the slurry to a spray dried powder.

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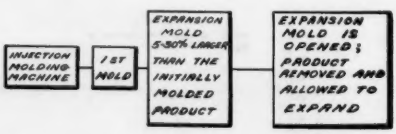
**4,314,954**

## METHOD OF PRODUCING MOLDED BODIES OF EXPANDED PLASTIC

**Lars Ringdal, Oslo, Norway, assignor to Bakelittfabrikken A/S, Oslo, Norway**

**Filed Sep. 6, 1979, Ser. No. 72,925**
**Claims priority, application Norway, Sep. 13, 1978, 783102**
**Int. Cl.³ B29D *27/00*; B29F *1/08***
**U.S. Cl. 264—45.5** **10 Claims**


INJECTION MOLDING MACHINE
1ST MOLD
EXPANSION MOLD 5-30% LARGER THAN THE INITIALLY MOLDED PRODUCT
EXPANSION MOLD IS OPENED; PRODUCT REMOVED AND ALLOWED TO EXPAND

1. A method of producing molded bodies of expanded plastic of a predetermined density, in which a starting marterial of plastic in granulate or powder form to which a blowing agent and optionally a cross-linking agent have been added is introduced into an injection molding machine where the starting material is heated and injected into a mold, characterized in that the material is heated to a temperature at which it becomes plastic but which is lower than the temperature required to initiate the reaction of the blowing agent and optional cross-linking agent, that the material in this state is injected into a mold having a lower temperature and is given a shape approximately that of the desired final product, after which the blank thus formed is transferred at any suitable later time to an expansion mold having the shape of the desired product but of larger dimensions than the initially molded blank, and is heated in this mold to the activating temperature for the blowing agent and the optional cross-linking agent and thereby expanded, after which the blank is quickly removed from the mold and immediately expands into its permanent shape.

5. A method according to claim 1, characterized in that the blanks in the expansion mold are subjected to a cooling effect at specified locations at which a partial extra reinforcement is desired in the finished product.

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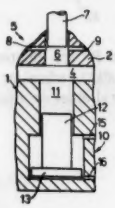
**4,314,955**

## METHOD OF FILLING CAVITIES, IN PARTICULAR, MOLD CAVITIES, WITH A REACTIVE FLOWABLE MIXTURE

**Heinrich Boden, Leverkusen, and Walter Schneider, Overath, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany**

**Filed Aug. 21, 1980, Ser. No. 180,183**
**Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 2934354**
**Int. Cl.³ B29D *27/00*; B29F *1/04***
**U.S. Cl. 264—51** **4 Claims**




1. In a method of filling cavities and, in particular, molds, with a reactive solid-forming or foam-forming mixture comprising introducing at least two reactants into a spatially limited mixing zone, mixing said reactants therein as they pass therethrough and conveying the mixture produced into a cavity where it reacts, the improvement wherein

(a) the volume of the cavity is initially increased beyond the final volume to be obtained while introducing the reaction mixture into the cavity whereby

(ba) the rate of flow of the mixture in the cavity is reduced and whereby

(bb) mixture is stored in the additional cavity volume,

(c) upon completion of introduction of the mixture, the volume of the cavity is reduced again whereby

(ca) the stored mixture is displaced at least partially into the form-giving cavity and whereby

(cb) the rate of flow of the mixture is kept smaller than during the actual filling process.

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**4,314,956**

## HIGH YIELD SILICON CARBIDE PRE-CERAMIC POLYMERS

**Ronald H. Baney, and John H. Gaul, Jr., both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.**

**Filed Jul. 23, 1980, Ser. No. 171,556**
**Int. Cl.³ F27B *9/04***
**U.S. Cl. 264—65** **15 Claims**

10. A method of preparing a silicon carbide-containing ceramic article which consists of

(A) forming an article of the desired shape from a polysilane having the average formula

$$\{(CH_3)_2Si\}\{CH_3Si\}$$

in which polysilane there is from 0 to 60 mole percent

$(CH_3)_2Si=$ units and 40 to 100 mole percent $CH_3Si=$ units, wherein there is also bonded to the silicon atoms other silicon atoms and radicals having the formula

—NHR

wherein R is hydrogen, an alkyl radical of 1 to 4 carbon atoms or phenyl wherein essentially all the remaining bonds on silicon are attached to chlorine or bromine atoms such that the polysilane contains from 14 to 60 weight percent of —NHR when R is an alkyl radical, 14 to 66 weight percent of —NHR when R is a phenyl radical, from 14 to 25 weight percent of —NHR when R is hydrogen and either 0 to 25 weight percent chlorine or 0–35 weight percent bromine, all based on the weight of the polysilane; and

(B) heating the article formed in (A) in an inert atmosphere or in a vacuum to an elevated temperature in the range of 1200° C. to 1600° C. until the polysilane is converted to silicon carbide-containing ceramic.

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**4,314,957**

## METHOD FOR MANUFACTURE OF POLYMER-IMPREGNATED HOLLOW CONCRETE PRODUCT

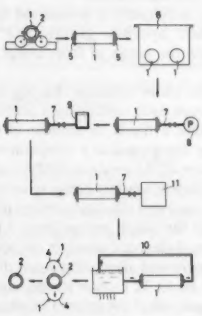
**Seiichi Ozawa, Tokyo, Japan, assignor to Ozawa Concrete Industry Co., Ltd., Tokyo, Japan**

**Filed May 14, 1980, Ser. No. 149,161**

**Claims priority, application Japan, May 19, 1979, 54/61012; Nov. 29, 1979, 54/153582**

**Int. Cl.³ B28B *21/20, 21/94, 21/36***

**U.S. Cl. 264—102** **4 Claims**



1. A method for the manufacture of a polymerimpregnated hollow concrete product, comprising the steps of (a) placing a concrete mix in a frame capable of withstanding high temperature and high pressure and shaped to form a product defining a hollow portion, (b) tightly closing the frame containing the concrete mix to mold the concrete mix into the hollow concrete product, (c) heating the tightly closed frame until the molded concrete contained therein has been cured, and, after strength has developed in the cured molded concrete, (d) drying the cured molded product and then deaerating the cured product in the frame interior, (e) supplying a monomer to the hollow portion of the deaerated concrete product within the frame, (f) applying pressure on the frame interior until the monomer has been diffused in the fine voids of the concrete product, and (g) heating the monomer entrapped in the concrete product in the frame until the monomer has been polymerized.

**4,314,958**

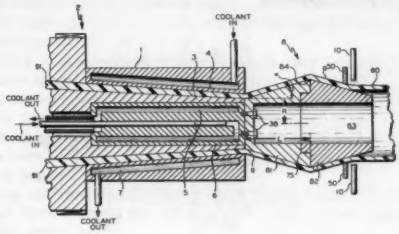
## PLASTIC PIPE EXTRUSION

**Kenneth S. Macleod, and Gary Fink, both of Calgary, Canada, assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Jul. 22, 1980, Ser. No. 171,219**

**Int. Cl.³ B29D *23/04*; B29F *3/08***

**U.S. Cl. 264—167** **11 Claims**




1. A process to produce a plastic pipe having an external diameter that can be selected within a range of external diameters using an extruder with one and the same die opening for any diameter within said range, said process comprising:

(a) extruding a plastic pipe through said die opening of said extruder formed between a bushing and an internal mandrel,

(b) guiding the so extruded semi-molten pipe over an external expanding mandrel having in the direction of the pipe movement a first section of continuously increasing cross-section and followed by a second section of continuously decreasing cross-section,

(c) allowing the so expanded pipe to shrink,

(d) cooling the expanded and shrinking pipe at a preselected axial location within a range of axial cooling locations to effectively stop said shrinking, said range of cooling locations corresponding to said range of external diameters of said pipe.

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**4,314,959**

## PROCESS FOR THE PREPARATION OF REGENERATED CELLULOSE FORMED BODIES FROM SOLUTIONS OF CELLULOSE DERIVATIVES IN ORGANIC SOLVENTS

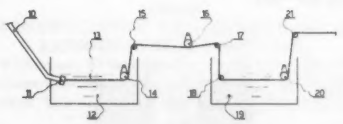
**Roberto Leoni, Milan; Alberto Baldini, Garlasco; Angelo Calloni, and Gianfranco Angelini, both of Buscate, all of Italy, assignors to SNIA Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A., Italy**

**Filed Apr. 21, 1980, Ser. No. 142,617**

**Claims priority, application Italy, Apr. 24, 1979, 22109 A/79**

**Int. Cl.³ D01F *2/00***

**U.S. Cl. 264—187** **15 Claims**

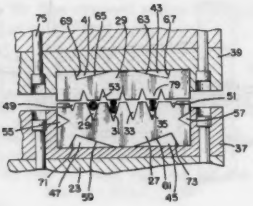


1. A process for the preparation of a shaped regenerated cellulose body from a spinning dope comprising a solution of methylol derivatives of cellulose in an organic solvent selected from the group consisting of dimethylformamide, dimethylacetamide, dimethylsulphoxide and N-methyl-pyrrolidone, followed by coagulation in a coagulating bath, wherein the coagulation bath contains, as its main component, a high boiling alcohol capable of reacting with free formaldehyde and with the bound (para) formaldehyde of the methylol derivative, to a degree which varies according to the temperature.

## 4,314,960
## MOLDING RESIN AROUND ELECTRICAL CONNECTOR HAVING LEADS EXTENDING THEREFROM

**Alan R. Hass, Albion, Ind., assignor to Lyall Electric, Inc., Albion, Ind.**

**Division of Ser. No. 47,320, Jun. 11, 1979, Pat. No. 4,236,689. This application Aug. 6, 1980, Ser. No. 175,759**
**Int. Cl.³ B29C *6/04***
**U.S. Cl. 264—276** **4 Claims**



1. The method of manufacturing an insulated electrical connector having terminals therein and electrical leads connected to the terminals extending therefrom comprising the steps of:

positioning the terminals within a first mold cavity portion with the leads all extending therefrom in the same general direction;

engaging the leads and a notched resilient wire guide;

intermeshing another notched resilient member with the wire guide;

closing a second mold cavity portion on the first mold cavity portion and simultaneously therewith deforming the wire guide and other notched resilient member to conform closely about the leads in substantially a leak-free manner to define an enclosed region containing the terminals;

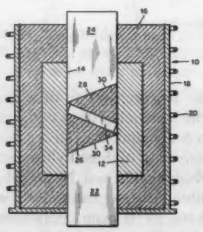
injecting a flowable insulating material into the enclosed region; solidifying the insulating material, opening the mold cavity portions, removing the formed connector; and

positioning further terminals within the first mold cavity portion preparatory to forming a further connector.

## 4,314,961
## METHOD FOR HOT PRESSING IRREGULARLY SHAPED REFRACTORY ARTICLES

**William E. Steinkamp, Clinton, and Ambrose H. Ballard, Knoxville, both of Tenn., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.**

**Division of Ser. No. 871,872, Jan. 24, 1978, abandoned. This application Jun. 14, 1979, Ser. No. 48,331**
**Int. Cl.³ B29C *3/06***
**U.S. Cl. 264—325** **3 Claims**



1. A method for hot pressing particulate refractory material into substantially uniformly dense articles of varying cross-sectional thicknesses, comprising the steps of confining a first compact of varying longitudinal thickness in a longitudinally extending die cavity, placing an essentially non-compressible block in the die cavity, placing a second compact of a size and configuration similar to that of said first compact in the die cavity to position said block therebetween in a contacting relationship with both of said compacts and to position the thicker portions of the second compact longitudinally opposite the thinner portions of the first compact, displacing die punches disposed at opposite sides of said die cavity with said compacts therebetween towards one another to press said compacts with said die punches having surfaces in contact with the compacts configured to uniformly bear against the surfaces defined by the thicker and thinner portions of the compacts, said block being oriented by said compacts prior to the pressing thereof so as to be rotated by the compacts upon the displacement of said die punches for maintaining substantially uniform volume displacements of the particulate material to substantially uniformly densify said compacts, and heating said compacts while being pressed by said die punches to a temperature sufficient to sinter the particulate material to form said articles.

## 4,314,962
## PHENOL EXTENDED POLYURETHANES PREPARED BY RIM PROCESS

**John C. Wollensak, Bloomfield Hills, and Kryn G. Ihrman, Farmington, both of Mich., assignors to Ethyl Corporation, Richmond, Va.**

**Filed Dec. 29, 1980, Ser. No. 220,749**
**Int. Cl.³ B29F *1/00*; C08G *18/32***
**U.S. Cl. 264—328.6** **3 Claims**

1. A process for preparing a RIM polyurethane molded product, said process comprising

(i) at a temperature within the range of about 15° C. to about 100° C. subjecting to static impingement mixing

(a) a catalyst,

(b) an organic polyisocyanate,

(c) an aliphatic polyhydroxy compound having two or more aliphatic hydroxy groups and a molecular weight within the range of from about 400 to about 7000, and

(d) an aromatic chain extender having two aromatic hydroxy groups each containing a reactive hydrogen which is either a liquid or soluble in said aliphatic polyhydroxy compound at a temperature within the range of about 15° C. to about 100° C. said dihydroxyaromatic chain extenders being selected from

I. dihydroxybenzenes and alkyl-substituted dihydroxybenzenes, wherein the alkyl groups have up to about 6 carbon atoms and the total number of carbon atoms in the alkyl groups in said alkyl-substituted dihydroxybenzene has up to about 12 carbon atoms, and

II. alkylene bridged, alkyl-substituted bisphenols wherein the alkylene bridge contains up to about 6 carbon atoms and the total number of carbon atoms in the alkyl groups attached to each benzenoid nucleus is at least one but does not exceed about 12; whereby a preproduct is produced,

(ii) subsequently injecting a shot of said preproduct at said temperature into a closed preheated mold having a temperature of from about 15° C. to about 100° C.,

(iii) opening the mold and removing the formed polyurethane molded product, and

(iv) optionally subjecting said molded product to a post-cure at a temperature within the range of from about 50° C. to about 150° C. said process being conducted such that the amount of dihydroxyaromatic compound is from about 5 to about 30 weight percent of the total weight of components (a)-(d) and such that there is a substantially stoichiometric ratio of isocyanate groups on the one hand and the total of hydroxy groups in said aliphatic polyhydroxy

compound and said dihydroxyaromatic chain extender on the other.

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4,314,963

## METHOD AND A DEVICE FOR PRODUCING SHAPED ARTICLES FROM A MULTI-COMPONENT REACTION MIXTURE

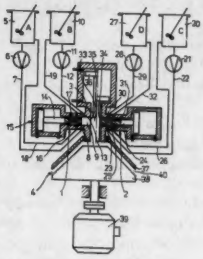
**Heinrich Boden, Leverkusen; Bernhard Rentz, Leverkusen; Johann Niggemann, Leverkusen, and Gerhard Just, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany**

**Filed Aug. 1, 1980, Ser. No. 174,471**

**Claims priority, application Fed. Rep. of Germany, Aug. 18, 1979, 2933553**

**Int. Cl.³ B29F *1/03*; B29D *27/00***

**U.S. Cl. 264—328.6** **10 Claims**



1. In a method of producing polymeric shaped articles from a multi-component reaction mixture by mixing the individual components to form the multi-component reaction mixture and introducing this mixture into a shaping zone in which it is cured to form the shaped article, the improvement wherein:

(a) at least two flowable reactants are each fed to at least two separate premixing zones, and a flowable multi-component reaction mixture is produced in each of the premixing zones, and

(b) these flowable multi-component reaction mixtures are fed to an at least single-stage subsequent mixing zone and mixed together therein.

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4,314,964

## METHOD FOR THE MANUFACTURE OF A CYCLE OR AUTO-CYCLE WHEEL RIM

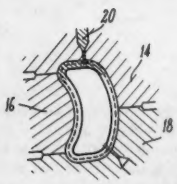
**Jean-Paul Ferrary, 5, Rue Le Chatelier, 75017 Paris, France**

**Filed Jun. 27, 1980, Ser. No. 163,774**

**Claims priority, application France, Jul. 2, 1979, 79 17137**

**Int. Cl.³ B29D *3/02*; B60B *5/02***

**U.S. Cl. 264—501** **5 Claims**



1. A method of manufacturing a reinforced hollow cycle or auto-cycle wheel rim, said method comprising:

placing a inflatable sleeve coaxially within a braided glass fiber sleeve thereby forming a concentric sleeve assembly;

providing a mould which has a toroidal mold cavity of a shape corresponding to the exterior shape of a wheel rim to be formed, at least one plastic material injection channel extending into said mold cavity, and at least one air inlet channel extending into said mold cavity;

positioning within said mold cavity a length of said concentric sleeve assembly sufficient to extend around said mold cavity; such that said at least one air inlet channel extends inside said inflatable sleeve

injecting air through said at least one air inlet channel into the interior of said inflatable sleeve, and thereby inflating said sleeve to form a toroidal hollow chamber within said mold cavity;

injecting plastic material through said at least one plastic material injection channel extending to between the inflated sleeve and said braided glass fiber sleeve, such that said plastic material impregnates said braided glass fiber sleeve and fills between the inflated sleeve and said mold to form a molded plastic body having embedded therein said braided glass fiber sleeve;

heating said mold to thereby set said molded plastic body and form a wheel rim reinforced by said braided glass fiber sleeve; and

removing said wheel rim from said mold.

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4,314,965

## STERILIZATION PROCESS USING A HEAT EFFECT ADDITIVE

**Olivier Cerf, Paris; Georges Grenier, Epernon; Jean Hermier, Paris, and Alain Rancurel, Leves par Mainvilliers, all of France, assignors to Laboratoires Pharmascience, France**

**Filed Apr. 2, 1980, Ser. No. 136,512**

**Claims priority, application France, May 16, 1979, 79 12403**

**Int. Cl.³ A61L *2/04, 2/18***

**U.S. Cl. 422—28** **5 Claims**

1. A process for the sterilization or decontamination of apparatus by destruction of spores in contact with said apparatus comprising

contacting said apparatus for about 1 to about 60 minutes with an aqueous solution containing about 0.5% to about 2% by weight of a heat effective catalyst of the formula

$$R-O-CH_2-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_2-NH_2$$

wherein R represents an alkyl radical of from 5 to 14 carbon atoms, or a salt or a base of said compound,

maintaining the temperature of said solution in the range of about 60° C. to about 100° C., maintaining the pressure of said solution at about atmospheric pressure, and

correlating the sterilization parameters of time of contact and temperature of solution with respect to the particular strain of spores being treated using moist heat sterilization destruction kinetics data for said strain of spores.

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4,314,966

## METHOD OF CONTROL OF ACID DRAINAGE FROM EXPOSED PYRITIC MATERIALS

**Robert Kleinmann, 5774 Smith Dr., Bethel Park, Pa. 15102**

**Continuation-in-part of Ser. No. 94,426, Nov. 15, 1979, abandoned. This application Sep. 12, 1980, Ser. No. 186,898**

**Int. Cl.³ A61L *2/22***

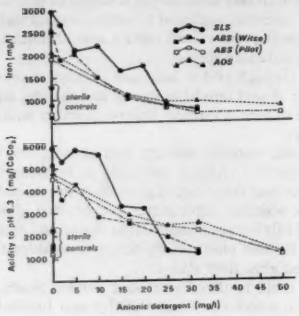
**U.S. Cl. 422—28** **17 Claims**

1. A method of reducing acid drainage in a pyritic material which is exposed to water, which method comprises:

(1) treating each acre-foot of pyritic material with at least seven pounds of a first anionic detergent which inhibits the bacterium *Thiobacillus ferrooxidans;* and

(2) adding at least 10 mg of a second anionic detergent which inhibits the bacterium *Thiobacillus ferrooxidans* per liter of said water which contacts the exposed material, said addition being effected by controlled release from a matrix containing said second anionic detergent dispersed

therein; said first and second anionic detergent being selected from the group consisting of *Thiobacillus ferrooxi-*




*dans*-inhibiting water soluble salts of (a) alkyl aryl sulfonic acids, (b) alkyl sulfonic acids, (c) alkenyl sulfonic acids, (d) sulfated fatty esters.

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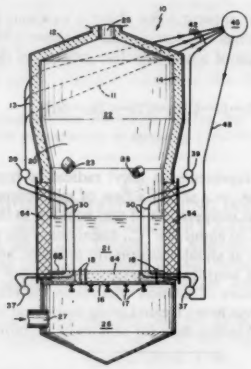
**4,314,967**

## FLUIDIZED BED REACTOR WITH VERTICAL COOLING COILS

**Henry S. C. Kwon, Norwalk, and Walfred W. Jukkola, Westport, both of Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.**

**Filed Oct. 2, 1980, Ser. No. 193,286**
**Int. Cl.[3] B01J *8/24;* F27B *15/14;* B01J *8/44***
**U.S. Cl. 422—49** **5 Claims**



**1.** A fluidized bed reactor comprising a reactor vessel having a reaction chamber therein,

said reaction chamber including a fluidized bed zone in the lower portion thereof and a freeboard zone above said fluidized bed zone,

a windbox separated from said reaction chamber by a constriction plate,

said constriction plate being capable of supporting a body of particulate solids thereon in said fluidized bed zone,

tuyeres mounted in said constriction plate and extending upwardly into said reaction chamber providing gas ports for injecting fluidizing gases into said reaction chamber to thereby form a fluidized bed of said particulate solids in said fluidized bed zone,

at least some of said tuyeres having said gas ports spaced from said constriction plate at a distance such that a region having a substantial depth of static or quiescent particulate solids is established between the said spaced gas ports and said constriction plate,

a generally horizontal water header for heat exchange fluid external to said reactor vessel,

a generally horizontal steam header for heat exchange fluid external to said reactor vessel and at a level higher than said water header,

a plurality of heat exchanger coils in said reactor chamber,

the arrangement of water header, steam header and heat exchanger coils affording natural circulation of water and steam,

said heat exchanger coils each comprising an essentially vertical central section and upper and lower angle bend sections attached to the extremities of said vertical central section,

said upper angle bend section passing through the wall of said reactor vessel and connecting the upper end of said vertical central section of said heat exchanger coil to said stream header,

said lower angle bend section passing through the wall of said reactor vessel and connecting the lower end of said vertical central section of said heat exchanger coil to said water header,

said vertical central section being positioned in said fluidized bed zone of said reactor chamber,

said upper angle bend section being positoned in said freeboard zone of said reactor chamber,

said lower angle bend section being positioned in said region of static or quiescent particulate solids on said constriction plate and a plurality of removable hatches secured in the wall of said reactor vessel and in each of which are sealingly secured a plurality of said heat exchanger coils whereby said hatches with the heat exchanger coils associated therewith can be removed from the reactor vessel for inspection and maintenance.

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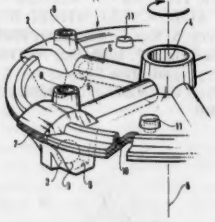
**4,314,968**

## SIMULTANEOUS ANALYSIS APPARATUS

**Jean Guigan, 9, rue Jean Mermoz, 75008 Paris, France**

**Filed Oct. 20, 1980, Ser. No. 198,323**
**Claims priority, application France, Oct. 26, 1979, 79 26615; Jan. 11, 1980, 80 00583; May 23, 1980, 80 11511**
**Int. Cl.[3] G01N *33/50, 1/10, 31/00, 21/07***
**U.S. Cl. 422—64** **15 Claims**

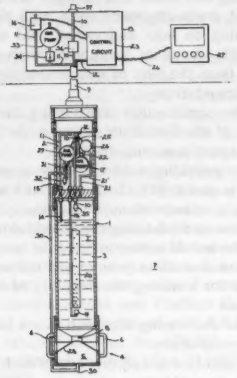


**1.** Analysis apparatus comprising an analysis rotor, said rotor including firstly a plurality of peripheral cells each of which contains a solid reaction support, said solid reaction support holding successively, a quantity of first reagent such as a biological liquid which contains the substance to be analysed, and then a quantity of second reagent which contains a protein on which a biological indicator is fixed, and secondly means for conveying a washing liquid to each cell, and wherein each of said cells is provided with a peripheral orifice for removing liquid and having an upper portion provided with a reagent inlet orifice and a lower portion which accomodates said reagent.

## 4,314,969
## SUBMERSIBLE RESPIROMETER

Robert M. Arthur, and Jerome J. Triatik, both of Fond du Lac, Wis., assignors to Arthur Technology, Inc., Fond du Lac, Wis.

Filed Aug. 29, 1980, Ser. No. 182,664
Int. Cl.[3] C12K *1/34;* G01N *7/00*
U.S. Cl. 422—68 10 Claims



1. A submersible respirometer, the combination comprising:
a housing suitable for submersion in a body of liquid;
an aeration chamber formed within the housing and including an opening which communicates with the body of liquid in which the housing is submerged;
valve means mounted to said housing and being operable to open and close said opening to enable liquid samples to flow into and out of the aeration chamber;
an air circulation system for circulating air trapped within the aeration chamber above the liquid sample, said air circulation system including an air pump, an output line which connects to said air pump and extends beneath the surface of the liquid sample, and an intake line which connects to the air pump and communicates with the air space trapped within the aeration chamber above the liquid sample;
an oxygen analyzer operable to generate an electrical signal indicative of the amount of oxygen contained within the air trapped within the aeration chamber; and
means coupled to said aeration chamber for injecting pressurized air into it to expel the liquid sample from the aeration chamber through said opening.

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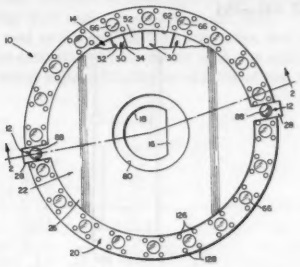
## 4,314,970
## ANALYSIS SYSTEM

Bernard Stein, Andover, Mass., and Richard A. Granoff, Chester, N.H., assignors to Instrumentation Laboratory Inc., Lexington, Mass.

Filed Aug. 27, 1980, Ser. No. 181,814
Int. Cl.[3] G01N *21/07, 21/09*
U.S. Cl. 422—72 17 Claims

1. A multicuvette rotor assembly for use in a clinical chemistry analyzer of the centrifugal type comprising
a body member that defines a circumferential array of spaced radially extending recesses, with divider structure in each recess to define a first chamber and a second chamber radially outward from said first chamber,
said body member having a series of radially extending reference surface areas extending around the periphery thereof,
a circumferential array of first optical windows in the base of said body member, the upper surface of each said first optical window being parallel to said series of reference surface areas,
a ring member having a circumferential array of second optical windows in said ring member and a series of mating reference surface areas, said series of mating reference surface areas corresponding to and seated in direct contact engagement with said reference surface areas of said body member such that the inner peripheral edge of said ring member is located radially outwardly of the middle of said second chambers,
the lower surface of each said second optical window being parallel to said mating reference surface areas, and in alignment with said first optical windows such that each



pair of opposed aligned surfaces of corresponding first and second optical windows are parallel to one another and define an optical path of precise and stable path length,
and a cover member that has sealing surfaces for engagement with the edges of the recesses of the body member and the inner peripheral edge of the ring member such that said cover member encloses and seals said recesses to retain reagent and sample material to be analyzed within said chambers.

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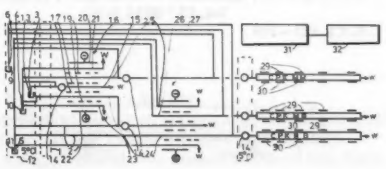
## 4,314,971
## MOLECULAR SEPARATION AND ISOENZYME ANALYZERS

Alvin S. Blum, 2350 Del Mar Pl., Ft. Lauderdale, Fla. 33301

Continuation-in-part of Ser. No. 898,998, Apr. 21, 1978, Pat. No. 4,264,327, Ser. No. 968,907, Dec. 13, 1978, Pat. No. 4,254,084, and Ser. No. 972,670, Dec. 26, 1978, Pat. No. 4,259,079. This application Nov. 24, 1980, Ser. No. 209,838
Int. Cl.[3] G01N *33/56, 35/08*
U.S. Cl. 422—82 15 Claims

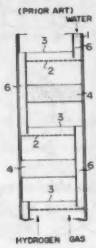


1. Apparatus for analysis of molecules in a sample fluid mixture in a flowing stream comprising: means for moving said sample fluid mixture in a flowing stream; separation means for separating certain molecules in said mixture into separate flowing streams on the basis of differential movement of said molecules by electrical force across membrane means, wherein said separate flowing streams are separated from one another by permeable or semi permeable membrane means; and measuring means disposed at at least one of said separate streams to measure concentration of particular molecules in fluid in said separate stream.

## 4,314,972
## MULTI-STAGE HYDROGEN WATER ISOTOPIC EXCHANGE COLUMN

Ryohei Nakane; Shohei Isomura, and Masami Shimizu, all of Tokyo, Japan, assignors to Rikagaku Kenkyusho, Saitama and Deryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, both of, Japan

Continuation of Ser. No. 76,945, Sep. 19, 1979, abandoned. This application Nov. 17, 1980, Ser. No. 207,466
Claims priority, application Japan, Sep. 27, 1978, 53/118815
Int. Cl.³ B01J *8/04*
U.S. Cl. 422—191 4 Claims




1. A multi-stage hydrogen-water isotopic exchange column having a top and a bottom comprising means for introducing water at the top of the column, means for introducing hydrogen gas containing deuterium at the bottom of the column and further comprising, at each stage, a vapor-and-water contact shelf through which water flows at a slow rate and the descending water contacts rising humidified vapor,

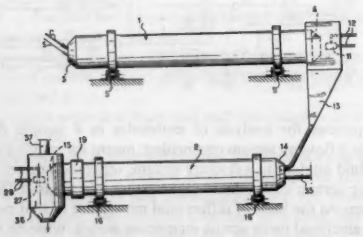
a hydrophobic catalyst shelf containing a metal catalyst for expediting the isotopic exchange reaction between the water vapor and hydrogen gas, spaced from and lying under the overlying vapor-and-water contact shelf, and

means for receiving the water dripping from the overlying vapor-and-water contact shelf and for guiding the water to a water channel extending through an underlying catalyst shelf and for scattering the water on the upper-surface of the vapor-and-water contact shelf of the next lower stage.

## 4,314,973
## INSTALLATION FOR ALKALINIZING AND PASTEURIZING COCOA BEANS BEFORE THEY ARE CRUSHED

Andre J. Aspa, Hardricourt, France, assignor to Commodities Trading & Development Ltd., Lausane, Switzerland

Filed Mar. 31, 1980, Ser. No. 135,346
Claims priority, application France, Apr. 3, 1979, 79 08356
Int. Cl.³ B01J *8/10*
U.S. Cl. 422—209 9 Claims



1. Apparatus for alkalinizing and pasteurizing cocoa beans before they are crushed, said apparatus comprising

a first drum communicating with the atmosphere and including an inlet and an outlet, said first drum being rotatable about its longitudinal axis so as to transport beans from said inlet to said outlet;

means provided at the inlet of the first drum for conjointly and continuously feeding the beans and an alkaline solution into the first drum;

heating means for heating the first drum so as to promote the reaction of the alkaline solution on the beans and for bringing said beans to a partially dried condition;

a second drum communicating with the atmosphere and including an inlet and outlet, said second drum being rotatable about its longitudinal axis so as to transport beans from the inlet of said second drum to the outlet of said second drum;

means for continuously transferring the beans leaving the outlet of the first drum through the inlet of the second drum into the second drum;

means for providing a stream of hot air whose input temperature is about 300° C. through said second drum in the direction of movement of said beans;

heating means for heating the second drum and cooperating with the hot air stream to bring the beans exiting the outlet of the second drum to an output temperature of about 90° C. and for lowering the humidity of said beans to below 2%; and

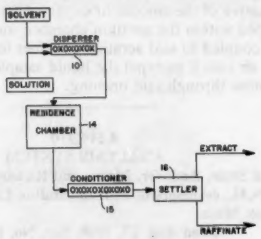
means for recovering the dried beans leaving the outlet of the second drum;

wherein said first and second drums each comprises a plurality of internal blades each disposed parallel to the longitudinal axis of the respective drum and regularly staggered angularly and longitudinally in relation to each other, and said first drum further includes support means for supporting each of the blades of the first drum in a spaced relationship with the internal wall of said first drum.

## 4,314,974
## SOLVENT EXTRACTION METHOD USING STATIC MIXERS

Donald R. Libby, Magnolia, and Sung J. Chen, North Andover, both of Mass., assignors to Chemineer, Inc., Dayton, Ohio

Filed Apr. 30, 1979, Ser. No. 34,805
Int. Cl.³ C01G *43/00*
U.S. Cl. 423—8 6 Claims




1. A process for recovering a metal ion from aqueous solutions containing dilute solutions of such metal ion comprising the steps of:

initially mixing said aqueous solution with a solvent extraction liquid immiscible with said aqueous solution to create a dispersion of drops of aqueous solution of a size in said extraction liquid which will maximize the mass transfer which occurs between said drops of aqueous solution and said extraction liquid;

maintaining, without further mixing, said dispersion for a time sufficient for mass transfer of said metal ion from said aqueous solution to said extraction liquid to occur;

further mixing said dispersion of drops of aqueous solution in extraction liquid to establish a narrow range of drop sizes within said dispersion which will minimize both the time

necessary for separation of said drops of aqueous solution from said extraction liquid and the entrainment of said drops of aqueous solution in said extraction liquid;

separating said drops of aqueous solution from said extraction liquid; and

recovering said metal ion from said extraction liquid.

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## 4,314,975
## METHOD FOR PREPARING TITANIUM TANNING AGENT

**David L. Motov, ulitsa Fersmana, 18, kv.19, Apatity Murmanskoi oblasti; Ljudmila P. Tjurkina, ulitsa Severnaya, 19, kv. 90, Apatity Murmanskoi oblasti; Lidia G. Gerasimova, ulitsa Gaidara, 7, kv. 69, Apatity Murmanskoi oblasti; Alexandr I. Metelkin, ulitsa Nagornaya, 46/48, korpus 20, kv. 31, Moscow; Isaak G. Shifrin, Skolkovskoe shosse, 26, kv. 24, Moscow; Nina I. Kolesnikova, 15 Parkovaya ulitsa, 23, kv. 20, Moscow; Galina G. Yakusheva, ulitsa Shkolnaya, 76, kv. 29, Vidnoe Moskovskoi oblasti; Maria M. Godneva, ulitsa Fersmana, 18, kv.19, Apatity Murmanskoi oblasti; Artur G. Babkin, ulitsa Fersmana, 18, kv. 34, Apatity Murmanskoi oblasti; Iridy I. Mikaelian, 2 Pugachevskaya ulitsa, 3, korpus 1, kv. 246, Moscow; Valentin I. Belokoskov, ulitsa Fersmana, 16, kv. 19, Apatity Murmanskoi oblasti, and Vladimir P. Plotnikov, ulitsa Zhdanova, 7, kv. 3, Sillamyae, all of U.S.S.R.**

**Filed Apr. 8, 1980, Ser. No. 138,364**

**Claims priority, application U.S.S.R., Nov. 11, 1979, 2831651; Nov. 11, 1979, 2831652**

**Int. Cl.³ C01C *1/242***

**U.S. Cl. 423—81** **2 Claims**

1. In a process for preparing a titanium tanning agent from a titanium-ferriferous starting solution, which process comprises the steps of introducing an oxidizing agent into the starting solution, thereafter adding an ammonium sulphate and sulfuric acid containing solution to precipitate ammonium titanyl bisulphate monohydrate salt of the formula $(NH_4)_2TiO(SO_4)_2.H_2O$, separating the precipitated salt from the solution to produce a solid salt and a residual solution, and washing the separated salt with a solution of ammonium sulphate, the improvement which comprises: adding an oxidizing agent to the starting solution in an amount between 0.01 to 2.0 grams per liter, based on $TiO_2$, in excess of the amount of oxidizing agent necessary to convert ferrous iron to ferric iron, said oxidizing agent comprising a sulphate solution of a peroxy-titanium complex, said complex being formed by the oxidation of a portion of said starting material.

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## 4,314,976
## PURIFICATION OF NICKEL SULFATE

**Maxson L. Stewart, Bremen, Ga.; Robert R. Odle, Harvey, La., and William W. Brunson, Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.**

**Filed Jul. 18, 1980, Ser. No. 170,197**

**Int. Cl.³ C01G *53/10***

**U.S. Cl. 423—139** **14 Claims**

1. A process for purification of nickel sulfate and copper sulfate from electrolyte in copper electrorefining, comprising:

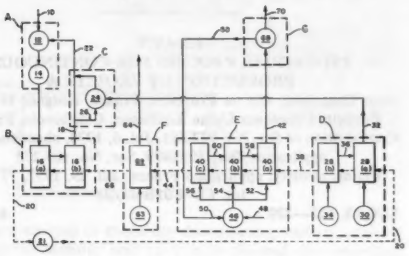
(a) providing as a starting material a predominately metallic sulfate residue crystallized from spent electrolyte from copper electrorefining, said residue being further characterized in that the predominate metallic constituent is nickel and in that copper is substantially the least electropositive metallic constituent;

(b) leaching the starting material in an aqueous ammonia solution of concentration at least about sufficient to solubilize said nickel as polyammine sulfate; and then separating the loaded leach solution from undissolved residue; then

(c) extracting said nickel from said leach solution by contacting said leach solution with a solvent-extractant; said extractant being characterized as having pH sensitive exchange-active hydrogen ions such that with increasing basic pH of the aqueous phase said extractant is progressively loaded with increasingly electropositive ions and with decreasing acidic pH stripping is in the reverse order; the pH of said leach solution having been adjusted via ammonia concentration sufficiently for loading of nickel; and then separating the loaded solvent-extractant from the depleted leach solution; then

(d) scrubbing said solvent-extractant with sulfuric acid to strip ions that are more electropositive than nickel ions from said extractant, the amount of said acid being adjusted such that the pH of the spent scrub solution is sufficiently acidic to approach the pH range for stripping of nickel ions; followed by separation of the spent scrubbing solution from said solvent-extractant; then

(e) stripping said nickel as sulfate by contacting said scrubbed solvent-extractant with sulfuric acid, the amount of said acid being adjusted such that the pH of the nickel-



loaded stripping solution is in the range wherein nickel-loaded sites of the extractants are regenerated; followed by separation of the nickel-loaded stripping solution from said solvent-extractant; then

(f) regenerating said depleted solvent-extractant by contacting with sulfuric acid to strip ions that are less electropositive than nickel ions from said extractant, the amount of said acid being adjusted such that the pH of the waste solution is substantially less than 1; and, after separation of the waste solution, recycling the solution, being substantially copper sulfate aqueous solution, to said copper electrorefining and recycling the regenerated solvent-extractant step (c); and then

(g) crystallizing nickel sulfate from said nickel-loaded stripping solution.

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## 4,314,977
## METHOD FOR REMOVING HYDROGEN SULFIDE AND NITRIC OXIDE FROM GASEOUS MIXTURES

**Metro D. Kulik, Pittsburgh, Pa., assignor to Conoco Inc., Stamford, Conn.**

**Filed May 27, 1980, Ser. No. 153,354**

**Int. Cl.³ B01D *53/34***

**U.S. Cl. 423—235** **10 Claims**

1. A method for removing $H_2S$ and NO from a gaseous mixture, said method comprising essentially of

(a) adjusting the amounts of $H_2S$ and NO in said gaseous mixture to a ratio $H_2S$/NO from about 0.5 to about 1.1

(b) admixing a free-oxygen containing gas with said mixture in an amount sufficient to convert said $H_2S$ to elemental sulfur and $SO_2$ and to convert said NO to nitrogen and $N_2O$.

4,314,978

## INCREASED PRODUCTION OF WET PROCESS PHOSPHORIC ACID BY GELATIN ADDITION

John C. Franklin, Arvada, Colo., assignor to Texasgulf Inc., Stamford, Conn.

Filed Jan. 29, 1981, Ser. No. 229,468
Int. Cl.³ C01B 25/16
U.S. Cl. 423—320 12 Claims

1. In a method for producing wet process phosphoric acid in a reaction system wherein at least one inorganic acid is reacted with a phosphate containing material for a period of time sufficient to develop filterable and washable calcium sulphate crystals, the improvement comprising:

adding a relatively small amount of gelatin to said reaction system to substantially increase the filtration rate of said calcium sulphate crystals without adversely affecting the quality of said wet process phosphoric acid.

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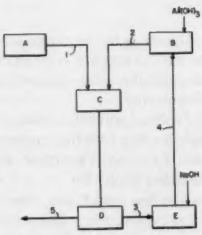
4,314,979

## INDUSTRIAL PROCESS FOR CONTINUOUS PRODUCTION OF ZEOLITE A

Jean Deabriges, Aix en Provence, France, assignor to PCUK Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Continuation of Ser. No. 922,341, Jul. 6, 1978, abandoned. This application Dec. 19, 1979, Ser. No. 105,273
Claims priority, application France, Jul. 29, 1977, 77 23373
Int. Cl.³ C01B 33/28
U.S. Cl. 423—329 6 Claims




1. A process for the continuous preparation of zeolite A, suitable for use in detergents to soften calcium containing waters, having a constant homogeneity and quality wherein at least about 90 percent of the product has a granulometry within a range of 4 microns and a median diameter between about 1 and about 10 microns is characterized by:

(a) instantaneously and continuously mixing at an elevated temperature in a reaction zone subjected to strong suction:

(i) a sodium silicate solution prepared from silica and NaOH which contains a minimal excess of NaOH and a $SiO_2/Na_2O$ molar ratio $\geqq 2.8$ to 1; and containing about 45 to 105 g/l of NaOH and about 120 to 350 g/l of $SiO_2$;

(ii) a sodium aluminate solution made from alumina and NaOH having an excess of NaOH solution, and containing about 80 to 110 g/l of NaOH and about 50 to 65 g/l of $Al_2O_3$;

(b) precipitating the zeolite while continuously stirring the resulting solution at an elevated temperature and while restricting the volume of the reaction zone to insure that there is a local excess of dissolved alumina in relation to dissolved silica in the solution; by:

(i) introducing the sodium silicate and sodium aluminate solutions into the suction zone created by a rapidly rotating turbine; and

(ii) adjacently surrounding the turbine with plates constructed and arranged to restrict the volume in which the above silicate and aluminate solutions are initially mixed;

(c) continuously removing the precipitated zeolite A and resulting liquor to a crystallization zone;

(d) continuously stirring the resultant precipitate and liquor in the crystallization zone at an elevated temperature until the desired crystallization is obtained;

(e) maintaining the concentration of the liquor in the crystallization zone between about 2 to 10 g/l of $Al_2O_3$;

(f) removing the most dense or larger particles in suspension at the bottom of the crystallization zone; and

(g) recovering the zeolite A containing at least about 90 percent of the particles within a range of about 4 microns and having a median diameter between about 1 and 10 microns and an ion exchange capacity greater than 85 mg. $Ca^{++}$/g of dry product.

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4,314,980

## PREPARATION OF REACTIVE BETA-DICALCIUM SILICATE

Ming-Shing Shen, Laramie, WY; James M. Chen, Rahway, N.J., and Ralph T. Yang, Amherst, N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 28, 1980, Ser. No. 125,406
Int. Cl.³ C01B 33/24
U.S. Cl. 423—331 7 Claims

1. A method of producing beta-dicalcium silicate in the form of fine particles which exhibit high reactivity to sulfur dioxide and which are suitable for use in desulfurization processes which comprises preparing a stiochiometric mixture of finely powdered calcium sulfate, silica, and a reducing agent selected from the group consisting of calcium sulfide, carbon, carbon monoxide, methane and hydrogen, adding to said mixture a carrier gas selected from the group consisting of nitrogen and carbon dioxide, and subjecting the resulting mixture to thermal treatment at approximately 900° C.

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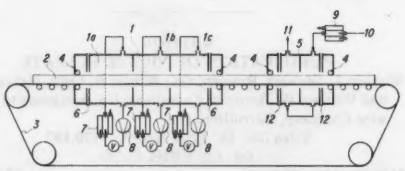
4,314,981

## METHOD FOR PREPARING CARBON FIBERS

Tamotsu Miyamori; Hisatsugu Kaji; Iwao Kameyama, and Michio Takahashi, all of Iwaki, Japan, assignors to Jureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1979, Ser. No. 105,130
Claims priority, application Japan, Dec. 26, 1978, 53-163715
Int. Cl.³ C01B 31/07
U.S. Cl. 423—447.7 17 Claims




1. A method of preparing carbon fibers from a pitch, wherein the pitch is spun into pitch fibers, the pitch fibers are treated with an oxidizing gas and the treated fibers are carbonized into the carbon fibers, said method comprising:

loading said pitch fibers on a net-belt conveyor at a packing density of 30 to 300 kg/m³ at a packing height of up to 500 mm.

introducing the loaded pitch fibers on said net-belt conveyor into a infusibilizing furnace having at least two exposing chambers arranged in series of increasing temperature said exposing chambers having a temperature gradient of 5° to 100° C. per chamber in the direction of from the inlet to the outlet of said infusibilizing furnace;

exposing the introduced pitch fibers to a gaseous mixture of air and a gaseous oxidizing agent by passing said gaseous mixture between said introduced fibers at a temperature lower than the softening point of said pitch fibers by 5° to 50° C., the velocity of said passing gaseous mixture being

increased in proportion to the packing density of the pitch fibers within the velocity range of 0.1 to 1.5 Nm/sec, thereby infusibilizing said pitch fibers,

introducing the thus infusibilized pitch fibers into a carbonizing furnace on the same or different net-belt conveyor, and

carbonizing the introduced infusibilized pitch fibers by a flow of an inert gas heated to a temperature of 400° to 1,500° C.

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4,314,982

## CATALYTIC DECOMPOSITION OF $H_2SO_4$

John H. Norman, La Jolla, and David G. Williamson, San Luis Obispo, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Jun. 21, 1979, Ser. No. 50,764
Int. Cl.³ C01B *17/48, 3/02, 17/52, 17/90*
U.S. Cl. 423—539 11 Claims

1. A multi-stage process for the catalytic decomposition of $H_2SO_4$ using different catalysts in each stage which process comprises

contacting $H_2SO_4$ in vapor form in a first stage reactor having a temperature gradient of at least about 100° K. with a platinum group metal catalyst at a temperature in the range between about 700° K. and 970° K. while heating said vapor to increase its temperature between about 100° K. and about 270° K., which platinum group metal catalyst is supported on a substrate selected from the group consisting of titania, or a mixture of barium sulfate, with about 2–30 weight percent titania to decompose at least about 40 percent of said $H_2SO_4$ to $SO_2$ under conditions approximating equilibrium conversion throughout said first stage reactor, and

contacting said vapors from said first stage with a catalyst selected from the group consisting of copper oxide and iron oxide in a later stage reactor above about 970° K. while further raising the temperature of said vapor and decomposing said vapor under conditions approximating equilibrium conversion throughout said later stage reactor,

said residence time of exposure to said catalysts in said first and second stages totalling not more than about 7 seconds and said decomposition approximating equilibrium conversion throughout said stages and the total decomposition equaling at least about 95% of equilibrium value at the exit temperature from said second stage.

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4,314,983

## CATALYST AND PROCESS FOR OXIDIZING HYDROGEN SULFIDE

Robert H. Hass, Fullerton, and John W. Ward, Yorba Linda, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Apr. 4, 1979, Ser. No. 27,033
Int. Cl.³ C01B *17/52, 17/02*
U.S. Cl. 423—542 64 Claims

1. A process for oxidizing $H_2S$ in the gas phase comprising (1) contacting a gas comprising $H_2S$ and oxygen in a reaction zone with a solid catalyst whose essential active catalytic components comprise at least 5 wt.% vanadium, calculated as $V_2O_5$, and at least about 5 wt.% bismuth, calculated as $Bi_2O_3$, at contacting temperatures maintained in said reaction zone between about 250° and about 600° F. and at contacting pressures maintained between about 5 and 500 psia, with water vapor being present in said reaction zone at a partial pressure of more than about 1.0 psia, said contacting in said reaction zone being such that a substantial proportion of said $H_2S$ reacts with said oxygen to produce $SO_2$, and said catalyst being more resistant to deactivation for the conversion of $H_2S$ to $SO_2$ under the conditions maintained in said reaction zone than a comparable vanadium catalyst free of bismuth, and (2) removing from said reaction zone a substantial proportion of the $SO_2$ produced in said reaction zone.

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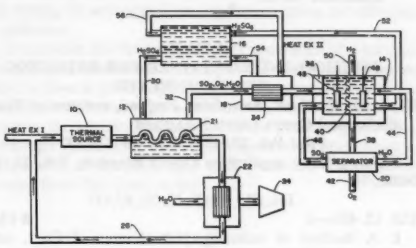
4,314,984

## THERMOCHEMICAL GENERATION OF HYDROGEN

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Daniel D. Lawson, Arcadia, and Gene R. Petersen, Pasadena, both of Calif.

Filed Apr. 30, 1980, Ser. No. 145,207
Int. Cl.³ C01B *13/00*
U.S. Cl. 423—579 8 Claims




1. In a method of thermally decomposing sulfuric acid, by heating the sulfuric acid to a high thermal decomposition temperature of about 830° C., the improvement comprising:

preheating the sulfuric acid before decomposition to a temperature of from 300° C. to 400° C. by directly mixing the sulfuric acid with a perfluoro (propylene oxide) liquid polymer having a degree of polymerization from about 10 to 60, said polymer being chemically stable to concentrated sulfuric acid at said temperature, having low miscibility with sulfuric acid at said temperature and having a low vapor pressure at said temperature to form a mixture.

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4,314,985

## RECOVERY OF MAGNESIUM AS MAGNESIUM HYDROXIDE FROM SEA WATER

Oren V. Bonney, White House Station, N.J., assignor to Amstar Corporation, New York, N.Y.

Filed Feb. 27, 1980, Ser. No. 125,253
Int. Cl.³ C01F *5/22*
U.S. Cl. 423—636 8 Claims

1. A process for producing and rapidly recovering magnesium hydroxide from a magnesium ion-containing aqueous liquid such as sea water and the like, comprising:

(a) treating said aqueous liquid with lime to react with the magnesium ions in said aqueous liquid to form an aqueous suspension of magnesium hydroxide particles;

(b) adding about 3 parts per million by weight of an anionic polyelectrolyte to said suspension to bring about at least partial agglomeration of the solid magnesium hydroxide particles in said suspension and thereby form a slurry thereof;

(c) introducing the resulting slurry as influent feed into a solids settling zone of a separation vessel, at a rate of about 4 gallons per minute per square foot of cross-sectional area of said settling zone, said influent feed being introduced into said settling zone beneath the upper boundary thereof, said settling zone zone containing a previously formed slurry having a higher concentration of agglomerated solid magnesium hydroxide therein than in said influent feed slurry;

(d) deflecting the path of said influent feed introduced within said settling zone horizontally and radially from the location of influent feed introduction to increase contact between said magnesium hydroxide particles in said influent feed and said agglomerated magnesium hy-

droxide in said settling zone to bring about additional agglomeration of the magnesium hydroxide particles introduced into said settling zone with said influent feed;

(e) allowing magnesium hydroxide agglomerates to settle to the bottom of said separation vessel with no additional agitation of the settling zone, save that provided hydraulically by the introduction of the influent feed;

(f) continuously removing a dense liquid-solids slurry fraction from said settling zone at a rate which maintains the upper boundary of said settling zone substantially stationary and in direct contact with an overlying body of clarified aqueous liquid for overflow; and

(g) separating the magnesium hydroxide agglomerates from the dense liquid solid slurry fraction removed from said separation vessel.

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4,314,986

## METHOD AND CONTAINER FOR REDUCING PERTECHNETATE

Clinton F. Ruddock, Amersham, England, assignor to The Radiochemical Centre Limited, England

Filed Feb. 25, 1980, Ser. No. 124,237

Claims priority, application United Kingdom, Feb. 27, 1979, 06883/79

Int. Cl.³ A61K *49/00, 43/00*

U.S. Cl. 424—1 8 Claims

1. A method of reducing pertechnetate $TcO_4^-$, which method consists essentially of:

(a) providing a vessel containing under sterile conditions tin or a tin-containing alloy as a reducing agent for the pertechnetate and a soluble salt of copper as an activator for the tin metal reducing agent,

(b) aseptically introducing into the vessel an aliquot of a solution of pertechnetate,

(c) and aseptically withdrawing from the vessel at least part of said aliquot comprising the reduced technetium.

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4,314,987

## METHOD FOR DIAGNOSING RHEUMATOLOGICAL DISEASES

Robert I. Morris; Allan L. Metzger, and Arnold S. Weiss, all of Los Angeles, Calif., assignors to Rheumatology Diagnostics Laboratory, Los Angeles, Calif.

Filed Apr. 4, 1979, Ser. No. 27,112

Int. Cl.³ G01N *33/48*

U.S. Cl. 424—1 8 Claims

1. A process for differential diagnosis of rheumatological diseases comprising:

drawing a blood speciman;

separating the serum to be tested from the blood specimen;

reacting the serum with an antigen to produce antinuclear antibodies;

labelling the antinuclear antibodies with a fluorescent material;

determining whether the antinuclear antibody labelling for a positive immunofluorescent pattern has produced a homogeneous pattern, rim pattern, speckled pattern or nucleolar pattern;

testing the same serum separated from the blood specimen in a continuous sequence for Systemic Lupus Erythematosus or Mixed Connective Tissue Disease if the pattern is a rim pattern or speckled pattern, respectively.

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4,314,988

## FOLIC ACID DERIVATIVES AND PROCESS FOR PREPARATION

Peter R. Farina, North Salem, and James A. Grattan, Croton-on-Hudson, both of N.Y., assignors to Baker Instruments Corp., Bethlehem, Pa.

Filed Oct. 31, 1979, Ser. No. 90,063

Int. Cl.³ G01N *33/56, 33/60;* G01T *1/00*

U.S. Cl. 424—1 4 Claims

1. In a competitive protein binding assay of folic acid, its metabolites, or derivatives which comprises contacting a sample containing folic acid, its metabolites, or derivatives with a binder for folic acid, its metabolites, or derivatives and a radiolabeled acceptor composition capable of binding in competition with folic acid, its metabolites, or derivatives, incubating for a suitable time, separating and removing the unbound portions of the folic acid, its metabolities, or derivatives and counting the radioactivity of at least one of the said bound and unbound portions, said radiolabeled acceptor composition consisting of three linked components: a substituted pteridine moiety, a p-aminobenzoyl moiety, and a radiolabel acceptor moiety, the improvement in said assay which consists of using as said radiolabel acceptor moiety an amino acid moiety or a des-carboxyamino acid moiety containing radioiodinated aromatic or heterocyclic ring attached to the p-aminobenzoyl moiety via an amide bond through a linear chain having no more than five atoms.

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4,314,989

## METHIONINE SULFOXIDE AMFLIORATION OF ACETAMINOPHEN TOXICITY

Gerald M. Rosen, 403 Knob Ct., Chapel Hill, N.C. 27514

Filed May 7, 1980, Ser. No. 147,451

Int. Cl.³ A61K *31/195, 31/165*

U.S. Cl. 424—10 10 Claims

1. A method of reducing the chronic or acute toxic effects of acetaminophen in humans which comprises administering to a human ingesting a toxic amount of acetaminophen, a nontoxic ameliorative amount of methionine sulfoxide, said administration of methionine sulfoxide being proximate in time to said ingestion of acetaminophen.

8. A pharmaceutical composition comprising, in unit dosage form, an analgesic or antipyretic effective amount of acetaminophen in admixture with a non-toxic amount of methionine sulfoxide which is effective to reduce the incidence of side effects associated with acetaminophen therapy.

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4,314,990

## TOOTHPASTE COMPOSITIONS

William D. Denny, Jr., and Thomas A. Wetzel, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 15, 1979, Ser. No. 84,485

Int. Cl.³ A61K *7/18*

U.S. Cl. 424—52 7 Claims

1. A toothpaste composition comprising:

(A) from about 6% to 45% of a silica dental abrasive;

(B) from about 30% to 70% of a humectant;

(C) from about 0.01% to 3% of a fluoride ion source; and

(D) from about 10% to 45% of water; said composition additionally containing an amount of a phosphate buffering agent providing from about 0.1% to 1% $PO_4^{-3}$, the amount being sufficient to maintain the pH of a 3:1 water/composition weight ratio slurry in the range of about 6.8 to 8.0.

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4,314,991

## SULFONATED POLYAMINO ACIDS AS DENTAL PLAQUE BARRIERS

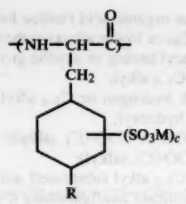
Tibor Sipos, Lebanon, N.J., assignor to Johnson & Johnson Products Inc., New Brunswick, N.J.

Filed Jul. 25, 1980, Ser. No. 172,353

Int. Cl.³ A61K *7/16;* C07C *103/52*

U.S. Cl. 424—56 5 Claims

1. A polyamino acid sulfonate having repeating units selected from the group consisting of the repeating units having structure (A),



(A)

wherein R is selected from the group consisting of hydrogen and hydroxyl; subscript c, representing the average number of sulfonate groups per phenyl ring, has a value in the range of from about 0.5 to about 1.0; and M is an ion selected from the group consisting of lithium, sodium, potassium, calcium, magnesium zinc, aluminum, hydrogen and the ammonium salts derived from ammonia and the pharmaceutically acceptable organic amines.

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**4,314,992**

## PROCESS FOR PRODUCING FASCIOLIASIS VACCINE

**Peter K. Bitakaramire, Nairobi, Kenya**

**Filed Nov. 6, 1979, Ser. No. 92,259**

**Claims priority, application United Kingdom, Nov. 8, 1978, 43695/78; Feb. 5, 1979, 03989/79**

**Int. Cl.³ A61K *41/00, 35/56***

**U.S. Cl. 424—88** **3 Claims**

1. A process for producing a fascioliasis vaccine which comprises breeding snails of the species *Lymnaea natalensis*, infecting said snails with *Fasciola gigantica* miracidia, growing the infected snails until they shed *Fasciola gigantica* cercariae, which thereupon encyst to become metacercariae, collecting said metacercariae, subjecting said metacercariae to a uniform gamma irradiation dosage of from 2500 to 3500 rads from a radioactive caseium-137 source to destroy the pathogenic character of flukes excysting from said metacercariae in the gut of an animal to which said metacercariae have been administered but without substantially altering the immunogenic character of said metacercariae, and collecting said irradiated metacercariae to constitute the effective ingredient of said vaccine.

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**4,314,993**

## IMMUNOGENIC *E. COLI* ST ENTEROTOXIN DERIVATIVES AND COMPOSITIONS CONTAINING THEM

**Frans V. Wijnendaele, Ottenburg, Belgium, assignor to Smithkline-RIT, Belgium**

**Filed Apr. 4, 1980, Ser. No. 137,326**

**Int. Cl.³ A61K *39/108, 39/02;* C07G *7/00***

**U.S. Cl. 424—92** **2 Claims**

1. A *E. coli* ST enterotoxin derivative which consists in *E. coli* enterotoxin crosslinked with a dialdehyde, a di-ketone, a carbodiimide, an isocyanate, an epihalohydrin or a difluoride.

2. A composition for immunizing humans or animals against diarrheal disease due to *E. coli* enterotoxin infection which comprises an *E. coli* ST enterotoxin derivative of claim 1, a pharmaceutical or veterinary carrier for intramuscular, subcutaneous or oral administration thereof and a stabilizer therefor.

**4,314,994**

## PROCESS FOR OBTAINING A PLASMINOGEN ACTIVATOR

**Lucien Dussourd d'Hinterland, and Gerard Normier, both of Castres, France, assignors to Pierre Fabre S.A., Paris, France**

**Filed Jul. 24, 1980, Ser. No. 172,029**

**Claims priority, application France, Jul. 27, 1979, 79 19432**

**Int. Cl.³ A61K *35/12, 35/14***

**U.S. Cl. 424—95** **12 Claims**

1. A process for separating a tissual plasminogen activator, which comprises at least the following steps:

(i) selectively absorbing said activator on a support with specific affinity comprising soluble fragments of fibrin covalently bonded to an insoluble matrix; and

(ii) eluting the activator from the fibrin bearing the adsorbed activator.

8. In a process for the preparation or separation of a plasminogen activator wherein an extract powder of animal organs are treated in several purifying steps to give a precipitate containing the desired plasminogen activator, the improvement which comprises the selective adsorption of the plasminogen activator through the addition of soluble fragments of fibrin fixed by covalence on an insoluble rigid matrix and the elution of the activator from the fibrin support.

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**4,314,995**

## PHARMACEUTICAL LACTOBACILLUS PREPARATIONS

**Kosei Hata, Osaka; Tadayo Hata, Tondabayashi, and Toshiyuki Maruoka, Toyonaka, all of Japan, assignors to Seikenkai, Osaka, Japan**

**Continuation of Ser. No. 964,006, Nov. 27, 1978, abandoned, which is a continuation of Ser. No. 772,333, Feb. 25, 1977, abandoned. This application Oct. 16, 1979, Ser. No. 85,349**

**Claims priority, application Japan, Feb. 23, 1976, 51-19226**

**Int. Cl.³ A61K *39/02***

**U.S. Cl. 424—93** **43 Claims**

1. A process for treating a patient having infection or infectious disease which comprises administering locally to said patient, in an amount effective to treat said infection or infectious disease, at least one microorganism strain which is similar to conventional Lactobacillus strains in its morphological properties, but different from known strains of Lactobacillus in its nutritional requirements, said strain of microorganism being able to grow in or the growth of which is promoted by a culture medium comprising (1) a low nutrition culture medium wherein conventional Lactobacillus is unable to grow, and (2) at least one substance selected from the group consisting of (a) $Na_2S$, (b) $NH_3$, (c) lower fatty acids and (d) mixtures thereof, said lower fatty acids not promoting the growth of conventional Lactobacillus when added to said low nutrition culture medium, said at least one strain being selected from the group consisting of microorganism FRI strain No. 1946, microorganism FRI strain No. 2779, microorganism FRI strain No. 2780, microorganism FRI strain No. 2781 and microorganism FRI strain No. 2782.

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**4,314,996**

## OXYGEN SENSOR

**Satoshi Sekido, Yawata, and Kozo Ariga, Takatsuki, both of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan**

**Filed Apr. 1, 1980, Ser. No. 136,404**

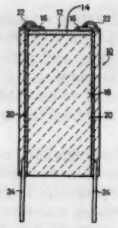
**Claims priority, application Japan, Apr. 4, 1979, 54-40566; Jun. 11, 1979, 54-73402; Aug. 24, 1979, 54-108287; Aug. 27, 1979, 54-108967; Sep. 25, 1979, 54-122988**

**Int. Cl.³ G01N *27/12***

**U.S. Cl. 422—98** **11 Claims**

1. An oxygen sensor element of the resistance type comprising a substrate made of a ceramic and a pair of electrodes electrically connected to said substrate and spaced apart from each other, said ceramic comprising: a powder of a compound

oxide of the perovskite type having the formula $ABO_3$ in which A represents an element of a lanthanum family, an alkaline earth metal or a mixture thereof and B represents a transition metal, and a glass material which has a melting point equal to or higher than the temperature of calcination of the ceramic, and containing about 1 to 10 wt% of an oxide of the transition metal used, the glass material being contained in an



amount of about 20 to 30 parts by weight per 100 parts of the compound oxide; whereby said oxygen sensor element varies in resistance abruptly in the vicinity of a stoichiometric point of reducing and oxidizing gases when said oxygen sensor element is placed in an atmosphere at elevated temperature and is normally stabilized in resistance below the elevated temperature conditions, whereby a concentration of the oxidizing gas is stably detectable.

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**4,314,997**

## PURIFICATION OF PLASMA PROTEIN PRODUCTS

**Edward Shanbrom, 2252 Liane La., Santa Ana, Calif. 92705**

**Filed Oct. 6, 1980, Ser. No. 194,264**

**Int. Cl.³ A61K** *35/14, 37/00*

**U.S. Cl. 424—101** **10 Claims**

1. The method of reducing pyrogenicity, hepatitis infectivity and clotting activation of a plasma protein product comprising treatment of said product by prolonged contact with a solution or suspension of from about 0.25% to about 10% by weight of a non-denaturing amphiphile, followed by addition to the treatment mixture of a plasma protein precipitant to precipitate said plasma protein product and then separating said precipitate from the supernatant.

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**4,314,998**

## 6-DEOXYGLUCOSAMINE-PEPTIDE DERIVATIVES, THEIR PRODUCTION AND USE

**Yuichi Yamamura, Takarazuka; Akira Hasegawa, Gifu; Ichiro Azuma, Sapporo, and Shigeru Kobayashi, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

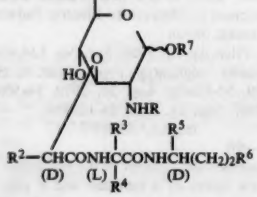
**Filed Feb. 22, 1980, Ser. No. 123,812**

**Claims priority, application Japan, Feb. 28, 1979, 54-23689; Jan. 8, 1980, 55-1201**

**Int. Cl.³ A61K** *37/00, 37/02;* **C07C** *103/52*

**U.S. Cl. 424—177** **13 Claims**

1. A compound of the formula:



wherein

R is hydrogen or an organic acid residue having an acyclic group of up to $C_{80}$ or lower alkoxycarbonyl;

$R^1$ is hydrogen or acyl having an acyclic group of up to $C_{80}$;

$R^2$ is hydrogen or $C_{1-6}$ alkyl;

$R^3$ and $R^4$ are each hydrogen or $C_{1-6}$ alkyl which may be substituted with hydroxyl;

$R^5$ is $CONH_2$, COOH or $COO\text{-}(C_{1-3}alkyl)$;

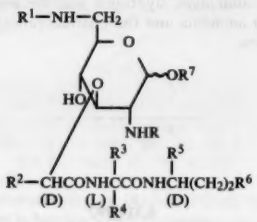
$R^6$ is COOH or $COO\text{-}(C_{1-3}alkyl)$;

$R^7$ is hydrogen or $C_{1-2}$ alkyl substituted with phenyl; and

(D) and (L) each indicate configurations if their respective carbon atoms are asymmetric

or a salt thereof.

13. A method for stimulating the immunological function of a warm-blooded aminal which comprises administering to said animal an effective amount of a compound of the formula:



wherein

R is hydrogen, an organic acid residue having an acyclic group of up to $C_{80}$ or lower alkoxycarbonyl;

$R^1$ is hydrogen or acyl having an acyclic group of up to $C_{80}$;

$R^2$ is hydrogen or $C_{1-6}$alkyl;

$R^3$ and $R^4$ are each hydrogen or $C_{1-6}$ alkyl which may be substituted with hydroxyl;

$R^5$ is $CONH_2$, COOH or $COO\text{-}(C_{1-3}alkyl)$;

$R^6$ is COOH or $COO\text{-}(C_{1-3}alkyl)$;

$R^7$ is hydrogen or $C_{1-2}$alkyl substituted with phenyl; and

(D) and (L) each indicate configurations if their respective carbon atoms are asymmetric

or a salt thereof.

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**4,314,999**

## N-ACYL DERIVATIVES OF GLUCOSAMINE HAVING ANTITUMOR CHEMOTHERAPEUTIC ACITIVITY

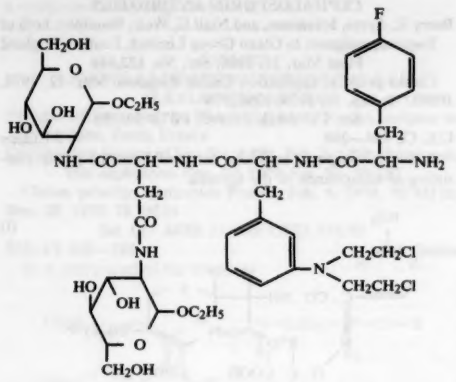
**Augusto De Barbieri, Milan, Italy, assignor to Proter S.p.A., Milan, Italy**

**Continuation-in-part of Ser. No. 929,237, Jul. 31, 1978, Pat. No. 4,216,208. This application Jul. 30, 1980, Ser. No. 173,621**

**Int. Cl.³ A61K** *37/02;* **C07C** *103/52*

**U.S. Cl. 424—177** **8 Claims**

1. An N-acyl derivative of D-glucosamine selected from the group consisting of a compound of the formula:



or a salt thereof with an organic or inorganic acid physiologically tolerated.

**4**. A pharmaceutical composition which is effective in controlling transplanted neoplasms in animals comprising an N-acyl derivative as claimed in any one of claims **1**, **2**, or **3** as an active ingredient in a pharmaceutically effective amount in a pharmaceutical carrier.

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**4,315,000**

**β-D-ARABINOFURANOSYLIMIDAZO(4,5-c)PYRIDINE COMPOUNDS AND METHODS FOR THEIR PRODUCTION**

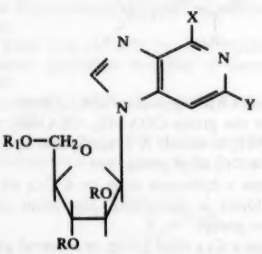
**P. Dan Cook, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.**

**Filed Jul. 7, 1980, Ser. No. 166,867**

**Int. Cl.**[3] **A61K** *31/70;* **C07H** *19/06, 19/08, 19/10*

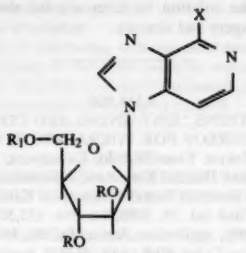
**U.S. Cl. 424—180** **26 Claims**

**1**. The compound having the structural formula:

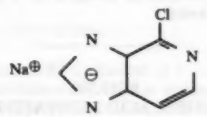


and the pharmaceutically acceptable salts thereof wherein when Y is hydrogen or $NH_2$, X is $NH_2$, OH or SH; R is hydrogen or acyl containing 2 or 3 carbon atoms; and $R_1$ is hydrogen, acyl containing 2 or 3 carbon atoms or phosphate.

**18**. An improved process for producing a compound of the formula



wherein X is $NH_2$, OH or SH; R is hydrogen or acyl containing 2 or 3 carbon atoms; and $R_1$ is hydrogen, acyl containing 2 or 3 carbon atoms or phosphate which comprises β-D-arabinofuranosylating 4-chloro-1H-imidazo-[4,5-c]pyridine with 2,3,5-tri-O-benzyl-α-D-arabinofuranosyl chloride; treating the resulting blocked nucleoside sequentially with hydrazine, Raney nickel and sodium in liquid ammonia to obtain 1-β-D-arabinofuranosyl-1H-imidazo[4,5-c]pyridin-4-amine and acylating, phosphorylating, treating with sodium nitrate then phosphorus pentasulfide to obtain the desired compounds wherein the improvement comprises treating 4-chloro-1H-imidazo[4,5-c]pyridine with sodium hydride in a suitable solvent to form the anion having the formula



and β-D-arabinofuranosylating said anion with 2,3,5-tri-O-benzyl-α-D-arabinofuranosyl chloride.

**23**. An antiviral composition comprising an effective amount of the compounds of claim **1** and a pharmaceutically acceptable carrier.

**25**. A method of treating Herpes simplex viral infection in a host by the administration of an effective amount of the compound according to claim **1**.

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**4,315,001**

**2-DEOXY GLUCOSE AS AN ANTIVIRAL AGENT AGAINST HERPES SIMPLEX**

**Herbert A. Blough, 4119 Kottler Dr., Lafayette Hill, Pa. 19444**

**Filed Aug. 17, 1979, Ser. No. 67,504**

**Int. Cl.**[3] **C07H** *31/70*

**U.S. Cl. 424—180** **7 Claims**

**1**. A method for treating herpes simplex virus infections in a human patient which comprises treating said patient with a composition comprising an amount of 2-Deoxy-D-Glucose which is effective against ocular herpes, labial herpes or genital herpes, in a pharmaceutically acceptable carrier.

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**4,315,002**

**SOLID PHARMACEUTICAL OR DIAGNOSTIC AGENT CONTAINING DEXTRAN AND ITS PREPARATION**

**Robert Maurer, Wattenheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany**

**Filed May 30, 1980, Ser. No. 154,896**

**Claims priority, application Fed. Rep. of Germany, Jun. 21, 1979, 2925009**

**Int. Cl.**[3] **A61K** *31/71, 37/48;* **C12N** *9/00*

**U.S. Cl. 424—181** **7 Claims**

**1**. A process for the preparation of a solid composition containing a pharmaceutical or diagnostic agent which comprises: dissolving the pharmaceutical or diagnostic agent and

dextran in water, placing the solution in a mold, and thereafter lyophilizing the solution to form a solid abrasion-resistant tablet of said agent and dextran.

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**4,315,003**

**COMPOSITIONS CONTAINING AZO COMPOUNDS AND USE THEREOF FOR THERAPEUTIC TREATMENT**

**Ei Mochida, Tokyo; Yasuo Suzuki, Kawaguchi; Haruo Onishi, Funabashi, and Hiroshi Kosuzume, Yokohama, all of Japan, assignors to Mochida Seiyaku Kabushiki Kaisha, Japan**

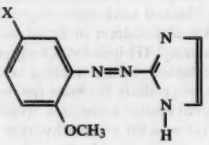
**Filed Jul. 29, 1980, Ser. No. 173,358**

**Claims priority, application Japan, Jul. 30, 1979, 54-97059**

**Int. Cl.³ A61K** *31/655*

**U.S. Cl. 424—226** **6 Claims**

**1.** A method of treating edema comprising administering to a patient suffering therefrom a fluid reducing effective amount of a compound of the formula



wherein X is hydrogen or halogen, or a pharmaceutically acceptable salt thereof.

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**4,315,004**

**FUSIDIC ACID DERIVATIVES**

**Welf von Daehne, Rungsted Kyst, and Poul R. Rasmussen, Frederikssund, both of Fed. Rep. of Germany, assignors to Leo Pharmaceutical products Ltd. A/S, Ballerup, Denmark**

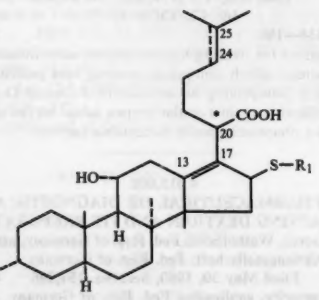
**Continuation-in-part of Ser. No. 906,664, May 16, 1978, which is a continuation of Ser. No. 744,978, Nov. 24, 1976, Pat. No. 4,100,276. This application May 31, 1979, Ser. No. 44,163**

**Claims priority, application United Kingdom, Dec. 3, 1975, 49714/75; Apr. 20, 1976, 16015/76**

**Int. Cl.³ A01N** *45/00;* **A61K** *31/56;* **C07J** *9/00*

**U.S. Cl. 424—238** **5 Claims**

**1.** A method for treating arthritis which comprises administering to a subject in need of such treatment an effective amount of a fusidic acid derivative selected from compounds of the formula I:



I

in which $R_1$ stands for straight or branched alkyl or alkenyl with from 2 to 6 carbon atoms, for phenyl-lower alkyl or for furyl-lower alkyl; or pharmaceutically acceptable, non-toxic salts and easily hydrolysable esters thereof, and pharmaceutically acceptable, non-toxic salts of such esters.

**4,315,005**

**CEPHALOSPORIN ANTIBIOTICS**

**Barry E. Ayres, Ickenham, and Niall G. Weir, Wembley, both of England, assignors to Glaxo Group Limited, London, England**

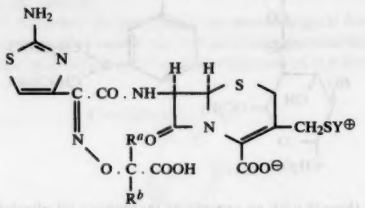
**Filed Mar. 21, 1980, Ser. No. 132,644**

**Claims priority, application United Kingdom, Mar. 22, 1979, 10088/79; Sep. 24, 1979, 32982/79**

**Int. Cl.³ A61K** *31/545;* **C07D** *501/56*

**U.S. Cl. 424—246** **9 Claims**

**1.** A cephalosporin antibiotic selected from the group consisting of compounds of the formula



(I)

(wherein $R^a$ and $R^b$, which may be the same or different, each represents a $C_{1-2}$ alkyl group, or together with the carbon atom to which they are attached form a $C_{3-6}$ cycloalkylidene group and $Y^{\oplus}$ represents an N-carbamoylmethylpyridinium group) and non-toxic salts and non-toxic metabolically labile esters thereof.

**9.** A method of combating a bacterial infection in a warm blooded animal comprising administering to said animal an antibacterially effective amount of at least one cephalosporin antibiotic as claimed in claim **1**.

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**4,315,006**

**BENZOXOCIN DERIVATIVES HAVING ANXIOLYTIC AND ANTI-CONVULSANT ACTIVITIES**

**Richard Storer, Wembley, England, assignor to Glaxo Group Limited, London, England**

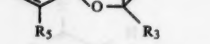
**Filed Aug. 8, 1980, Ser. No. 176,537**

**Claims priority, application United Kingdom, Aug. 9, 1979, 27800/79; May 1, 1980, 14559/80**

**Int. Cl.³ C07D** *311/78;* **A61K** *31/35;* **C07D** *405/04*

**U.S. Cl. 424—250** **9 Claims**

**1.** A compound of general formula (I):



(I)

wherein

$R_1$ represents a hydrogen atom or $C_{1-4}$ alkyl or $C_{2-4}$ alkenyl group, or the group $COANH_2$, $CSANH_2$, or $COANHCOCH_2NH_2$ in which A is methylene optionally substituted by a $C_{1-3}$ alkyl group; and

$R_2$ represents a hydrogen atom or a $C_{1-4}$ alkyl group; or $NR_1R_2$ forms a piperidino, piperazino or N-methylpiperazino group;

$R_3$ represents a $C_{1-4}$ alkyl group or a benzyl group;

$R_4$ represents a hydrogen or halogen atom; and

$R_5$ represents a hydrogen atom or a $C_{1-4}$ alkyl or $C_{1-4}$ alkoxy group, with the proviso that one of $R_4$ and $R_5$ is a hydrogen atom

and physiologically acceptable salts thereof.

**9.** A method for the treatment of a patient suffering from anxiety and/or convulsions which comprises administering to

the patient an anxiolytic or anti-convulsant effective amount of a compound according to claim 1.

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**4,315,007**

## 4-AMINO-6,7-DIMETHOXYQUINAZOL-2-YL ALKYLENEDIAMINES

**Philippe M. Manoury, Le Plessis Robinson, France, assignor to Synthelabo, Paris, France**

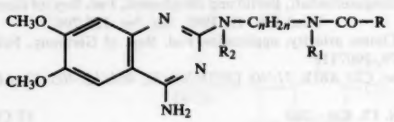
**Continuation-in-part of Ser. No. 8,931, Feb. 2, 1979, abandoned. This application Dec. 10, 1979, Ser. No. 99,622**

**Claims priority, application France, Feb. 6, 1978, 78 03175; Dec. 29, 1978, 78 36819**

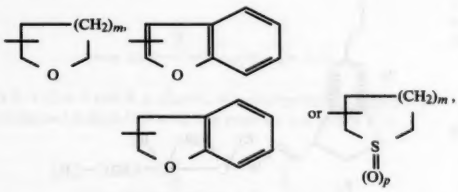
**Int. Cl.³ A61K** *31/505;* **C07D** *239/95*

**U.S. Cl. 424—251** **11 Claims**

1. A compound of the formula



wherein each or $R_1$ and $R_2$ is independently hydrogen; $C_{1-4}$ alkyl or benzyl; n is 2, 3, or 4; and R is $C_{3-6}$ cycloalkyl,



wherein m is 0, 1 or 2; and p is 0, 1 or 2, or a pharmaceutically acceptable salt thereof.

10. A pharmaceutical composition comprising an antihypertensively effective amount of at least one compound according to claim 1, 2, 3, 4 or 9 together with a pharmaceutically acceptable carrier or diluent.

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**4,315,008**

## COMBATING PESTS WITH O-ETHYL-S-N-PROPYL-O-(1-SUBSTITUTED-PYRAZOL-4-YL)-(THIONO)-THIOLPHOSPHORIC ACID ESTERS

**Fritz Maurer, Wuppertal; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

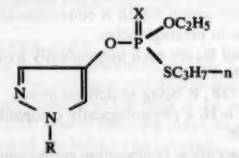
**Filed Nov. 19, 1979, Ser. No. 95,725**

**Claims priority, application Fed. Rep. of Germany, Dec. 16, 1978, 2854389**

**Int. Cl.³ A01N** *57/16;* **C07F** *9/65*

**U.S. Cl. 424—200** **9 Claims**

1. An O-ethyl-S-n-propyl-O-(1-substituted-pyrazol-4-yl)-(thiono)-thiolphosphoric acid ester of the formula



wherein

R is alkyl with 1 to 5 carbon atoms, cycloalkyl with 3 to 8 carbon atoms or phenyl, and

X is oxygen or sulphur.

8. A method of combating arthropods or nematodes which comprises applying to the arthropods or nematodes, or to a habitat thereof, an arthropodicidally or nematicidally effective amount of a compound according to claim 1.

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**4,315,009**

## ANTISECRETORY GUANIDINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

**Derrick F. Jones, Macclesfield, and Keith Oldham, Cheadle, both of England, assignors to Imperial Chemical Industries Limited, London, England**

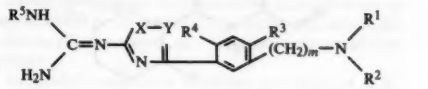
**Filed Jan. 18, 1979, Ser. No. 4,531**

**Claims priority, application United Kingdom, Jan. 18, 1978, 1992/78**

**Int. Cl.³ C07D** *277/20*

**U.S. Cl. 424—248.4** **11 Claims**

1. A guanidine derivative of the formula:



in which

X is sulphur;

Y is nitrogen, CH or $CCH_3$;

m is 0 or 1;

$R^1$ is hydrogen and $R^2$ is alkanoyl of 1 to 6 carbons or 4,5-dihydro-4-exothiazol-2-yl -A-B in which A is 3,4-dioxocyclobuten-1,2-diyl or C═Z in which Z is oxygen, sulphur, NCN, $NNO_2$, $CHNO_2$, $NCONH_2$, $C(CN)_2$, $NCOR^6$, $NCO_2R^6$, $NSO_2R^6$ or $NR^7$ in which $R^6$ is alkyl of 1 to 6 carbons and $R^7$ is hydrogen or alkyl of 1 to 6 carbons and B is alkyl, alkoxy or alkylthio of 1 to 6 carbons or $NR^8R^9$ in which $R^8$ and $R^9$, which may be the same or different, are hydrogen, alkyl of 1 to 10 carbons, alkenyl or alkynyl of 3 to 10 carbons in which the double or triple bond is separated from the nitrogen of $NR^8R^9$ by at least one carbon, (primary hydroxy)alkyl of 2 to 6 carbons, alkoxyalkyl of 3 to 10 carbons in which the oxygen is separated from the nitrogen of $NR^8R^9$ by at least two carbons, or pyridylmethyl, or, when $R^9$ is hydrogen, $R^8$ is 2-[(5-dimethyl-aminomethylfuran-2-yl)methylthio]ethylamino, or $R^8$ and $R^9$ may be joined together to form a 5- or 6-membered non-aromatic ring which optionally contains an additional nitrogen or oxygen;

$R^3$ is hydrogen or fluorine;

$R^4$ is hydrogen or, when $R^3$ is hydrogen, $R^4$ is halogen or methyl;

$R^5$ is hydrogen, alkyl of 1 to 6 carbons or alkoxyalkyl of 3 to 10 carbons in which the oxygen atom is separated from the nitrogen atom of the guanidine residue by at least two carbons: and the pharmaceutically-acceptable acid-addition salts thereof.

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**4,315,010**

## GLAUCINE PHOSPHATE SALTS

**Samuel S. M. Wang, Indianapolis, Ind., assignor to The Dow Chemical Company, Midland, Mich.**

**Continuation-in-part of Ser. No. 935,221, Aug. 21, 1978, abandoned. This application Jul. 13, 1979, Ser. No. 57,483**

**Int. Cl.³ A61K** *31/485;* **C07D** *215/20, 215/22*

**U.S. Cl. 424—260** **17 Claims**

1. A phospate salt of a member of the group consisting of l-glaucine, d,l-glaucine and mixtures thereof.

14. A method of alleviating coughing in animals, comprising orally administering to an animal an antitussive amount of a

phosphate salt of a member of the group consisting of l-glaucine, d,l-glaucine and mixtures thereof.

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**4,315,011**

## 1-ALKYL-9-BROMOHEXAHYDROINDOLO QUINOLIZIUM SALTS AND USE THEREOF TO INCREASE BLOOD FLOW

**Csaba Szantay; Lajos Szabo; Gyöorgy Kalaus; Lajos Dancsi; Tibor Keve; Egon Karpati, and Laszlo Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary**

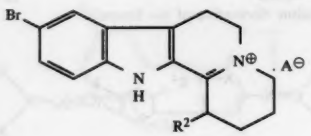
**Filed Jul. 10, 1979, Ser. No. 56,395**

**Claims priority, application Hungary, Jul. 12, 1978, RI 672; Jul. 12, 1978, RI 673; Jul. 12, 1978, RI 674; Jul. 12, 1978, RI 675**

**Int. Cl.³ A61K** *31/475;* **C07D** *459/00*

**U.S. Cl. 424—262** **3 Claims**

1. A 1-alkyl-9-bromo-hexahydroindoloquinolizium salt of formula,



(IX)

wherein

$R^2$ is an alkyl group of 1 to 6 carbon atoms and $A^{\ominus}$ is the anion of a pharmaceutically acceptable acid,

or a corresponding free base.

3. A method of increasing blood circulation and decreasing blood vessel resistance in an animal subject which comprises administering to the animal a pharmacologically effective amount of the pharmaceutically acceptable salt defined in claim 1 or a corresponding free base thereof.

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**4,315,012**

## 3-TETRAHALOETHYL-CYCLOPROPANE-1-CARBOXYLATE ESTERS

**Jacques Martel, Bondy; Jean Tessier, Vincennes, and Jean-Pierre Demoute, Montreuil-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France**

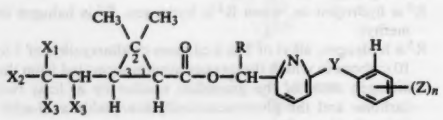
**Filed Nov. 10, 1980, Ser. No. 205,245**

**Claims priority, application France, Nov. 14, 1979, 79 28049**

**Int. Cl.³ A61K** *31/44;* **C07D** *213/55*

**U.S. Cl. 424—263** **55 Claims**

1. An ester in the form of their stereoisomers or mixtures thereof of the formula



$X_1$ is selected from the group consisting of fluorine, chlorine and bromine, $X_2$ is selected from the group consisting of fluorine, chlorine and bromine, $X_3$ is selected from the group consisting of chlorine and bromine, each Z is independently selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy and alkylthio of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, —$CF_3$, 3,4-methylenedioxy, chlorine, fluorine and bromine, n is 0, 1 or 2, Y is selected from the group consisting of oxygen and sulfur and R is selected from the group consisting of hydrogen, —CN and ethynyl, the acid moiety having a structure selected from the group consisting of 1R, cis; 1S, cis; 1R, trans; and 1S, trans and the alcohol moiety having a configuration of (R), (S) or (RS) and the asymetric carbon in the 1-position of the 3-ethyl side chain exists in the form of isomer A and isomer B.

32. A method of combatting acariens comprising contacting acariens with an acaricidally effective amount of a compound of claim 1.

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**4,315,013**

## CERTAIN PYRROLE ANALOGS OF PROSTACYCLIN DERIVATIVES

**Werner Skuballa; Bernd Raduechel; Helmut Vorbrueggen; Gerda Mannesmann; Wolfgang Losert, and Jorge Casals, all of Berlin, Fed. Rep. of Germany, assignors to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany**

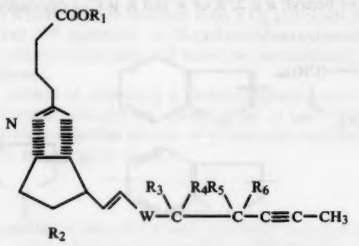
**Filed Feb. 19, 1980, Ser. No. 122,794**

**Claims priority, application Fed. Rep. of Germany, Feb. 20, 1979, 2907118**

**Int. Cl.³ A61K** *31/40;* **C07D** *209/52, 401/12, 405/12;* **A61K** *31/435*

**U.S. Cl. 424—263** **17 Claims**

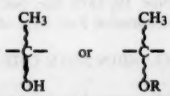
1. A prostane derivative of the formula



wherein

$R_1$ is (a) hydrogen, (b) $C_{1-10}$ alkyl, (c) $C_{1-10}$ alkyl substituted by halogen; $C_{1-4}$ alkoxy; $C_{6-10}$ aryl; $C_{6-10}$ aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 $C_{1-4}$ alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or $C_{1-4}$ alkoxy group; di-$C_{1-4}$-alkylamino; or tri-$C_{1-4}$-alkylammonium; (d) $C_{4-10}$ cycloalkyl, (e) $C_{4-10}$ cycloalkyl substituted by $C_{1-4}$ alkyl, (f) $C_{6-10}$ aryl, (g) $C_{6-10}$ aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 $C_{1-4}$ alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or $C_{1-4}$ alkoxy group, or (h) 2-furyl, 2-thienyl, 2-pyridyl, 3-pyridyl, or 4-pyridyl;

W is hydroxymethylene or RO-methylene; or



wherein OH or OR is in the α-position and

R is an in vivo hydrolyzable and physiologically acceptable ether or acyl group which is conventional for modifying OH groups in prostaglandins;

$R_3$, $R_4$, $R_5$ and $R_6$ are each independently hydrogen or alkyl of 1–5 carbon atoms,

$R_2$ is OH or OR, R being as defined above,

or, when $R_1$ is H, a physiologically compatible salt thereof with a base.

16. A pharmaceutical composition comprising an amount of a compound of claim 1 effective for lowering blood pressure and a pharmaceutically acceptable adjuvant.

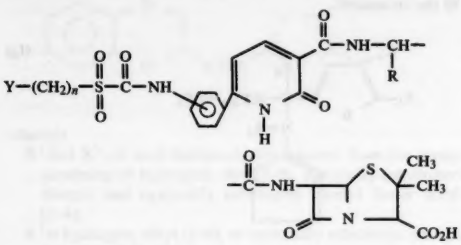
4,315,014

## ANTIBACTERIAL AMIDE COMPOUNDS AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

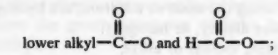
Thomas F. Mich, Ann Arbor, Mich., and Leonard Doub, Tucson, Ariz., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 24, 1980, Ser. No. 190,109
Int. Cl.³ A61K 31/44; C07D 499/70, 211/76, 213/64
U.S. Cl. 424—263 14 Claims

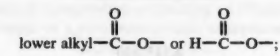
1. A compound of the formula



and pharmaceutically acceptable salts thereof; wherein Y is hydrogen, $CF_3$, hydroxy, pyridyl,



n is 0, 1, 2 or 3 and R is phenyl, 4-hydroxyphenyl, 2-thienyl or cyclohexa-1,4-dien-1-yl with the proviso that when Y is



n is 1, 2 or 3.

12. An antibacterial pharmaceutical composition comprising from 50 mg to 1000 mg of a compound of claim 1 and a pharmaceutical carrier.

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4,315,015

## PROCESS FOR PREPARING COOKED BACON HAVING REDUCED LEVELS OF N-NITROSAMINES

Richard F. Theiler, Scottsdale, Ariz., assignor to Armour and Company, Phoenix, Ariz.

Filed Oct. 14, 1980, Ser. No. 196,816
Int. Cl.³ A23B 4/02, 4/14
U.S. Cl. 426—266 15 Claims

1. A process for preparing cured bacon which, when cooked for consumption, contains substantially reduced levels of N-nitrosamines, said process comprising the steps of

preparing a nitrite-stable injectable curing solution comprising

a nitrite-containing pickle,

a liquid smoke in concentration to provide 5 to 400 ppm phenols and 10 to 2000 ppm carbonyl compounds, based upon the green weight of the belly to be injected, and

from 150 to 10,000 ppm of reducing sugar, based upon the green weight of the belly to be injected;

injecting said curing solution into a green belly; and

processing said belly to effect curing.

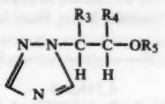
4,315,016

## HETEROCYCLIC TRIAZOLYLETHYL ETHER COMPOUNDS AND THEIR USE AS PESTICIDES

Sugavanam Balassubramanyan, Wokingham, and Margaret C. Shephard, Maidenhead, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 720,664, Sep. 7, 1976, abandoned. This application Feb. 27, 1978, Ser. No. 882,205
Claims priority, application United Kingdom, Sep. 10, 1975, 37242/75; Sep. 10, 1975, 37243/75
Int. Cl.³ A01N 43/64; C07D 249/08
U.S. Cl. 424—269 9 Claims

1. A compound of general formula:



wherein $R_3$ is hydrogen, $R_4$ is phenyl optionally substituted with one or two halogen, and $R_5$ is alkyl having up to 5 carbon atoms, alkenyl having up to 5 carbon atoms, alkynyl having up to 5 carbon atoms or $R_5$ is benzyl optionally ring substituted with halogen, alkyl or alkoxy, or a fungicidal acid salt of such a compound.

4. A fungicidal composition consisting essentially of as active ingredient, a fungicidally effective amount of a compound or salt as claimed in claim 1, and a carrier for the active ingredient.

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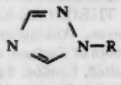
4,315,017

## TRIAZOLE DERIVATIVES

Friedrich Linhart, Heidelberg; Bernd Zeeh, Ludwigshafen, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 59,179, Jul. 20, 1979, abandoned. This application Mar. 28, 1980, Ser. No. 135,914
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1978, 2833194
Int. Cl.³ A61N 43/48, 43/64, 43/172, 47/10
U.S. Cl. 424—269 6 Claims

4. A process for combating insects, wherein the insects or their biotope are treated with an insecticidally effective amount of an insecticidal agent containing an insecticidally active carbamate selected from the group consisting of 2,5-diethylphenyl-N-methylcarbamate, 1-naphthyl-N-methylcarbamate, m-tolyl-N-methylcarbamate, 2-isopropylphenyl-N-methylcarbamate, 2-sec.-butylphenyl-N-methylcarbamate, 3-(1-methylbutyl)-phenyl-N-methylcarbamate, o-chlorophenyl-N-methylcarbamate, 3,4-dimethylphenyl-N-methylcarbamate, 3,5-diethylphenyl-N-methylcarbamate, 3-isopropyl-5-methylphenyl-N-methylcarbamate, 6-chloro-3,4-xylyl-N-methylcarbamate, 3,5-di-tert.-butylphenyl-N-methylcarbamate, 3,4,5-trimethylphenyl-N-methylcarbamate, 2-isopropylphenyl-N-methylcarbamate, 3,5-dimethyl-4-methylmercaptophenyl-N-methylcarbamate, 4-dimethylamino-m-tolyl-N-methylcarbamate, 4-dimethylamino-3,5-xylyl-N-methylcarbamate, 4-diallylamino-3,5-dimethylphenyl-N-methylcarbamate, 2-(1,3-dioxolan-2-yl)-phenyl-N-methylcarbamate, 4-benzothienyl-N-methylcarbamate, 2,3-dihydro-2,2-dimethylbenzofuran-7-yl-N-methylcarbamate, 2,2-dimethyl-1,3-benzodioxol-4-yl-N-methylcarbamate, 1-isopropyl-3-methyl-5-pyrazolyl-N,N-dimethylcarbamate, 2-dimethylcarbamoyl-3-methylpyrazolyl-(5)-N,N-dimethylcarbamate, 2-dimethylamino-5,6-dimethyl-4-pyrimidinyl-N,N-dimethylcarbamate, 2-(1-methoxy-2-chloro)-ethoxyphenyl-N-methylcarbamate, 3-(dimethylaminomethyleneimino)-phenyl-N-methylcarbamate, 4-(dimethylaminomethyleneimino)-m-tolyl-N-methylcarbamate, and 2-ethylthiomethylphenyl-N-methylcarbamate and a triazole derivative of the formula I as a synergist



I

where R denotes benzyl substituted on the phenyl ring by linear or branched alkyl of 1 to 4 carbon atoms, 2-phenylvinyl which is unsubstituted or substituted by halogen on the phenyl ring, 3-phenyl-2-propenyl which is unsubstituted or substituted by halogen on the phenyl ring, 2-phenyl-2-propenyl which is unsubstituted or substituted by halogen on the phenyl ring, 1-phenylethyl, 3-phenylpropyl or 2-phenyl-2-chloroethyl or a salt thereof, the ratio of carbamate to triazole derivative of the formula I, or a salt thereof, being from 1:10 to 10:1 parts by weight.

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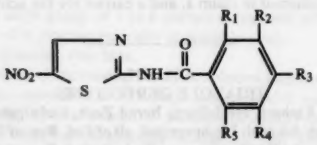
## 4,315,018
## SPECIFIC PARASITICIDAL USE OF 2-BENZAMIDO-5-NITRO-THIAZOLE DERIVATIVES

**Jean F. Rossignol, 16 Rue de Siam F-75016, Paris, France**

**Filed Dec. 7, 1978, Ser. No. 967,454**
**Int. Cl.³ A61K *31/425***
**U.S. Cl. 424—270** **33 Claims**

1. A process for treating a dog or cat infected with Taenia which comprises administering to the infected animal an eradicating effective amount of a compound of the formula:



in which one or two of the symbols $R_1$, $R_2$, $R_3$, $R_4$ and $R_5$ represents an acetoxy or propionyloxy group, and the remaining symbols represent hydrogen with the proviso that one of the remaining symbols can represent a methoxy group or a chlorine or bromine atom.

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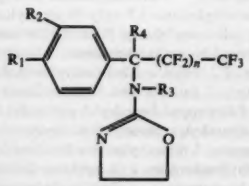
## 4,315,019
## NOVEL ARYLTRIFLUOROETHYLAMINES AND PROCESSES FOR PRODUCING THE SAME

**Charles Malen, Fresnes; Pierre Roger, St. Cloud, and Michel Laubie, Vaucresson, all of France, assignors to Science Union et Cie, Suresnes, France**

**Continuation of Ser. No. 798,830, May 20, 1977, abandoned. This application Aug. 18, 1980, Ser. No. 179,169**
**Claims priority, application France, May 24, 1976, 76 15601**
**Int. Cl.³ C07D *263/28, 413/12;* A61K *31/42, 31/425***
**U.S. Cl. 424—272** **5 Claims**

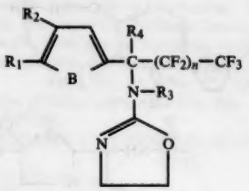
1. A compound selected from the group consisting of the aryl amines of formula I



(I)

wherein
$R_1$ and $R_2$, the same or different, are hydrogen, lower alkoxy, lower alkyl, or halogen;
$R_3$ is hydrogen, methyl or ethyl;
$R_4$ is hydrogen, methyl, ethyl or cyclopropyl;
n is 0, 1 or 2;
the therapeutically compatible salts thereof with mineral or organic acid, said amine and said salts being in racemic form, and the resolved, optically-active isomers of said amines and said salts thereof.

2. A method for treating hypertension in a mammal, which consists in administering to a mammal patient suffering from this ailment an amount of an oxazoline as below-defined in an amount which is effective for alleviating said condition; said oxazoline, in a racemic or optically-active form, corresponding to the structure



($I_A$)

where
B is a bridge radical selected from the group consisting of —CH=CH—, oxygen, sulfur and N—$R_5$ wherein $R_5$ is hydrogen or lower alkyl;
$R_1$ and $R_2$, being the same or different, are hydrogen, lower alkyl, lower alkoxy, or halogen;
$R_3$ is hydrogen, methyl or ethyl;
$R_4$ is hydrogen, methyl, ethyl or cyclopropyl, and
n is zero, 1 or 2.

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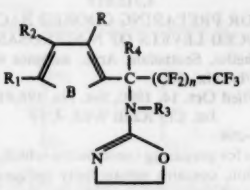
## 4,315,020
## OXAZOLINE (TRIFLUOROETHYL) AMINE

**Charles E. Malen, Fresnes; Pierre Roger, St-Cloud, and Michel Laubie, Vaucresson, all of France, assignors to Science Union et Cie, Suresnes, France**

**Division of Ser. No. 31,386, Apr. 19, 1979, Pat. No. 4,267,345, which is a continuation-in-part of Ser. No. 798,830, May 20, 1977, abandoned. This application Oct. 15, 1980, Ser. No. 197,170**
**Claims priority, application France, May 24, 1976, 76 15601**
**Int. Cl.³ A61K *31/42;* C07D *263/28***
**U.S. Cl. 424—272** **17 Claims**

1. An oxazoline (trifluoroethyl) amine of the formula



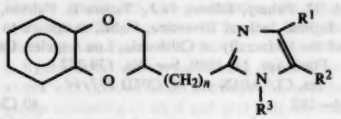
wherein
$R_1$ and $R_2$, the same or different, are hydrogen, lower alkoxy of 1 to 6 carbon atoms, inclusive, lower alkyl of 1 to 6 carbon atoms, inclusive, halogen, or trifluoromethyl,
$R_3$ is hydrogen, methyl, or ethyl,
$R_4$ is hydrogen, methyl, ethyl, or cyclopropyl,
R is hydrogen or lower alkyl of 1 to 6 carbon atoms, inclusive,
B is —CH=CH—, and
n is zero, 1 or 2.

## 4,315,021
## 2-(1,4-BENZODIOXAN-2-YLALKYL)IMIDAZOLES

Arthur F. Kluge, Los Altos; Arthur M. Strosberg, Portola Valley, both of Calif.; Roger Whiting, and George A. Christie, both of Edinburgh, Scotland, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Dec. 3, 1980, Ser. No. 212,288
Int. Cl.[3] A61K *31/415;* C07D *405/06*
U.S. Cl. 424—273 R 7 Claims

1. A compound of the formula



(I)

wherein

$R^1$ and $R^2$ are each independently selected from the group consisting of hydrogen, alkyl(1–6), optionally substituted phenyl, and optionally substituted phenyl lower alkyl (1–4);

$R^3$ is hydrogen, alkyl (1–6), or optionally substituted phenyl lower alkyl (1–4);

n is an integer equal to 0, 1 or 2;

with the proviso that $R^1$, $R^2$ and $R^3$ cannot all be hydrogen and/or alkyl; and substituted phenyl means that one to three hydrogens of the phenyl ring are replaced by identical moieties selected from the group consisting of halo, lower alkyl or trilfuoromethyl.

7. A method of treating depression in humans which comprises administering to a subject in need of such treatment, a therapeutically effective amount of a compound of claim 1 or a pharmaceutically acceptable acid addition salt thereof, or a pharmaceutical composition containing an effective amount of said compound or a pharmaceutically acceptable salt thereof.

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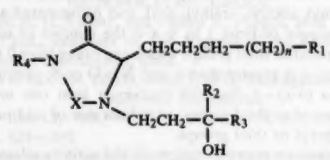
## 4,315,022
## TERMINAL AMINO PROSTAGLANDIN ANALOGUES

Gordon Wootton, Sawbridgeworth, and Stephen A. Smith, Harlow, both of England, assignors to Beecham Group Limited, England

Filed May 23, 1980, Ser. No. 152,766
Claims priority, application United Kingdom, May 23, 1979, 17931/79
Int. Cl.[3] A61K *31/415;* C07D *233/78, 233/86, 233/32*
U.S. Cl. 424—273 R 34 Claims

1. A compound of the formula:

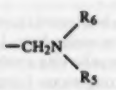


or a pharmaceutically acceptable salt thereof, wherein

n has a value of 0 to 5

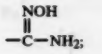
$R_1$ is an aminomethyl function selected from the group consisting of

(a)

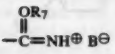


wherein each of $R_5$ and $R_6$ is independently hydrogen or alkyl of 1 to 6 carbon atoms;

(b)

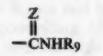


(c)



wherein $R_7$ is hydrogen or alkyl of 1 to 6 carbon atoms and $B^{\ominus}$ is a pharmaceutically acceptable anion; and

(d) $—CH_2NHR_8$ wherein $R_8$ is $—SO_2R_9'$, $—COR_9'$,



or $—(CH_2)_mCO_2R_9'$ in which

$R_9$ is hydrogen or alkyl of 1 to 6 carbon atoms,

$R_9'$ is alkyl of of 1 to 6 carbon atoms, benzyl or benzyl substituted with chloro, bromo, nitro or trifluoromethyl;

Z is oxygen or sulfur; and

m has a value of from 0 to 4;

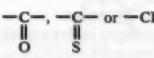
$R_2$ is hydrogen or alkyl of 1 to 4 carbon atoms;

$R_3$ is alkyl of 1 to 9 carbon atoms, cycloalkyl of 5 to 8 carbon atoms, or alkyl of 1 to 6 carbon atoms substituted with cycloalkyl of 5 to 8 carbon atoms or

$R_2$ and $R_3$ together with the carbon atom to which they are attached are cycloalkylidene of 5 to 8 carbon atoms;

$R_4$ is hydrogen or alkyl of 1 to 6 carbon atoms; and

X is



34. The method of effecting a prostaglandin-like response in a human or other animal which comprises administering thereto an effective amount of a compound according to claim 1.

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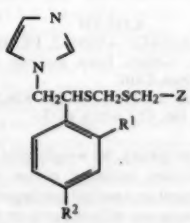
## 4,315,023
## 1-PHENETHYLIMIDAZOLE DERIVATIVES

Richard A. Partyka, Liverpool, N.Y., and Thomas W. Hudyma, Manlius, N.Y., assignors to Westwood Pharmaceuticals, Inc., Buffalo, N.Y.

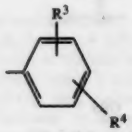
Continuation-in-part of Ser. No. 73,041, Sep. 6, 1979, abandoned. This application Dec. 1, 1980, Ser. No. 211,986
Int. Cl.[3] A61K *31/415;* C07D *233/60*
U.S. Cl. 424—273 R 43 Claims

1. A compound of the formula 3:



including the antimicrobial acid addition salts thereof, wherein;

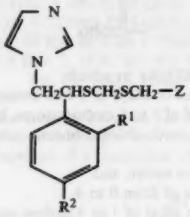
$R^1$ and $R^2$ are independently hydrogen or halogen and Z is a mono or disubstituted phenyl moiety of the formula 4:



4

wherein $R^3$ and $R^4$ are independently hydrogen, halogen, (lower) alkyl or trifluoromethyl, with the proviso that $R^3$ and $R^4$ may not simultaneously both be trifluoromethyl.

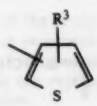
22. A compound of the formula 3:



3

including the antimicrobial acid addition salts thereof, wherein;

$R^1$ and $R^2$ are independently hydrogen or halogen and Z is a 2 or 3 thienyl moiety of the formula 5:



5

wherein $R^3$ is hydrogen, halogen (lower) alkyl or trifluoromethyl.

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**4,315,024**

## COMPOSITIONS AND METHOD FOR TREATING RED EYE

**Mark B. Abelson, Andover, Mass., assignor to Cooper Laboratories, Inc., Palo Alto, Calif.**

**Filed Aug. 8, 1980, Ser. No. 176,525**
**Int. Cl.³ A01N *43/50, 43/56***
**U.S. Cl. 424—273 R** **3 Claims**

1. A method of treating red eye comprising topically administering to the eye a therapeutic amount of an $H_2$ antagonist which is effective to substantially reduce the red appearance of the eye.

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**4,315,025**

## ROUGHAGE ANIMAL FEED

**Michael M. Danley, Grimes, Iowa, assignor to Chevron Research, San Francisco, Calif.**

**Filed Sep. 26, 1977, Ser. No. 836,280**
**Int. Cl.³ A01N *43/36***
**U.S. Cl. 424—274** **7 Claims**

1. A method for increasing the weight gain of a ruminating animal which comprises including captan in the animal's roughage feed allotment in a weight-gaining-effective amount between 1 and 200 parts per million based on the daily roughage feed allotment for the animal wherein said roughage feed contains at least 70% by weight alfalfa, forage sorghum, hay or other cellulosic feed having over 50% cellulose content.

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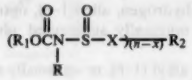
**4,315,026**

## ALKYLPOLYOXYSULFINYL AND ALKYLPOLYTHIOSULFINYL DERIVATIVES OF CARBAMATE ESTERS

**Mohamed A. H. Fahmy, Edison, N.J.; Tetsuo R. Fukuto, and Teruomi Jojima, both of Riverside, Calif., assignors to The Regents of the University of California, Los Angeles, Calif.**

**Filed Apr. 11, 1980, Ser. No. 139,352**
**Int. Cl.³ A01N *43/16;* C07D *317/44***
**U.S. Cl. 424—282** **40 Claims**

1. Carbamate esters having pesticidal activity selected from the class having the formula:



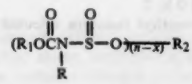
where R is methyl; $R_1$ is selected from the class consisting of a hydrocarbyl group containing from 1 to 20 carbon atoms, a 5 to 6 membered heterocyclic ring containing one to two O or S atoms, the remaining ring atoms being carbon atoms, and the group

where

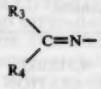
$R_3$ is hydrogen, alkyl, alkylthio or cyano, and

$R_4$ is alkyl, alkylthio, alkoxy, alkanoyl, alkoxycarbonyl, dialkylaminocarbonyl, or phenyl, which can be unsubstituted or substituted with cyano, nitro, alkylthio, alkylsulfinyl, alkylsulfonyl, or alkoxy groups, the number of aliphatic carbon atoms in $R_3$ and $R_4$ not exceeding eight; $R_2$ is hydrocarbyl group containing from 2 to 40 carbon atoms and derived from a compound selected from the group consisting of alkyl and aryl polyols, and alkyl and aryl polythiols, and which can contain unreacted hydroxyl groups or thiol groups, and protected hydroxyl or thiol groups, wherein the protecting groups are selected from the class consisting of isopropylidene, benzylidene, alkenyl, alkinyl, aralkyl, acyl, and halogenated acyl; n is an integer of from 1 to 8; x is the number of unreacted hydroxyl or thiol groups which can range from 0 to 7, and where n is greater than x; and X is O or S; provided that when (n-x)=1, $R_2$ shall contain at least one unreacted hydroxyl or thiol group, or at least one of said protected hydroxyl or thiol groups.

10. Carbamate esters having pesticidal activity selected from the class having the formula:



where R is methyl; $R_1$ is selected from the class consisting of a hydrocarbyl group containing from 1 to 20 carbon atoms, a 5 to 6 membered heterocyclic ring containing one to two O or S atoms, the remaining ring atoms being carbon atoms, and the group

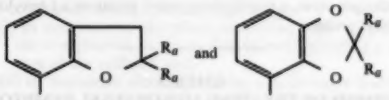


where

$R_3$ is hydrogen, alkyl, alkylthio or cyano, and

$R_4$ is alkyl, alkylthio, alkoxy, alkanoyl, alkoxycarbonyl, dialkylaminocarbonyl, or phenyl, which can be unsubstituted or substituted with cyano, nitro, alkylthio, alkylsulfinyl, alkylsulfonyl or alkoxy groups, the number of aliphatic carbon atoms in $R_3$ and $R_4$ not exceeding eight; $R_2$ is hydrocarbyl group containing from 2 to 40 carbon atoms and derived from a compound selected from the group consisting of alkyl and aryl polyols, and which can contain unreacted hydroxyl groups and protected hydroxyl groups, wherein the protecting groups are selected from the class consisting of isopropylidene, benzylidene, alkenyl, alkinyl, aralkyl, acyl, and halogenated acyl; n is an integer of from 1 to 8; x is the number of unreacted hydroxyl groups which can range from 0 to 7, and where n is greater than x; provided that when (n-x)= 1; $R_2$ shall contain at least one unreacted hydroxyl group or at least one of said protected hydroxyl groups.

**22**. Carbamates as defined in claim **1**, wherein $R_1$ is selected from the class having the formulae:



where $R_a$ is an alkyl group of 1 to about 4 carbon atoms, and both $R_a$'s can be the same or different.

**35**. An insecticidal composition comprising an insecticidally effective amount of a carbamate as defined in claim **22**, in admixture with a carrier.

**38**. The method of controlling insects which comprises applying to the sites of infestation an insecticidally effective amount of a compound as defined in claim **10**.

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**4,315,027**

## PESTICIDAL SYMMETRICAL AND ASYMMETRICAL SULFINYLDICARBAMATES CONTAINING A HETEROCYCLIC GROUP

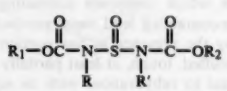
**Mohamed A. H. Fahmy, and Tetsuo R. Fukuto, both of Riverside, Calif., assignors to The Regents of the University of California, Los Angeles, Calif.**

**Division of Ser. No. 18,414, Mar. 7, 1979. This application May 9, 1980, Ser. No. 148,224**

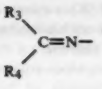
**Int. Cl.**[3] **A01N** *47/18;* **C07D** *317/48, 307/86*

**U.S. Cl. 424—282** **35 Claims**

**1**. A carbamate having pesticidal activity of the formula:



wherein R and R' are each a hydrocarbyl group containing 1 to 12 carbon atoms, and R and R' can be the same or different; $R_1$ is selected from the class consisting of a hydrocarbyl group containing from 1 to 20 carbon atoms, a 5 to 6 membered heterocyclic ring containing one to two O or one to two S atoms, and a group containing the >C═N—radical:



and where

$R_3$ is hydrogen, alkyl, alkylthio or cyano, and

$R_4$ is alkyl, alkylthio, alkoxy, alkanoyl, alkoxycarbonyl, dialkylaminocarbonyl, and phenyl, all of which can be unsubstituted or substituted with cyano, nitro, alkylthio, alkylsulfinyl, alkylsulfonyl and alkoxy groups, the number of aliphatic carbon atoms in $R_3$ and $R_4$ not exceeding eight; and $R_2$ can be other than $R_1$ and selected from the class consisting of a hydrocarbyl group containing from 1 to 20 carbon atoms and a 5 to 6 membered heterocyclic ring containing one to two O or one to two S atoms; or $R_2$ can be the same as $R_1$, where $R_1$ or $R_2$ is said heterocyclic ring, or both $R_1$ and $R_2$ are said heterocyclic rings.

**27**. The method of controlling insects which comprises applying to the sites of infestation an insecticidally effective amount of a compound as defined in claim **1**.

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**4,315,028**

## METHOD OF TREATMENT OF RHEUMATOID ARTHRITIS

**Israel H. Scheinberg, 5447 Palisades Ave., Bronx, N.Y. 10471**

**Division of Ser. No. 972,634, Dec. 22, 1978, abandoned, and a continuation-in-part of Ser. No. 926,688, Jul. 21, 1978, abandoned. This application Sep. 18, 1979, Ser. No. 76,652**

**Int. Cl.**[3] **A61K** *31/28, 31/30*

**U.S. Cl. 424—290** **10 Claims**

**1**. A method of treating rheumatoid arthritis, which comprises administering to a patient suffering from the same, a rheumatoid arthritis treatment effective amount of a complex of penicillamine or N-acetyl penicillamine complexed with gold or copper.

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**4,315,029**

## RACEMIC MODIFICATION CONSISTING OF SPECIFIC ISOMERS OF α-CYANO-3-PHENOXYBENZYL CIS- OR TRANS-2,2-DIMETHYL-3-(2,2,2-TRICHLOROETHYL)CYCLOPROPANECARBOXYLATE, PRODUCTION THEREOF AND PESTICIDAL COMPOSITIONS CONTAINING THE SAME

**Fumio Mori, Kurashiki; Yoshiaki Omura, Mitsu; Yoshiji Fujita, Kurashiki; Takashi Nishida, Kurashiki; Takeo Hosogai, Kurashiki; Fumio Wada, Fukuoka; Sukeji Aihara, Kurashiki; Yoshin Tamai, Kitakanbara, and Kazuo Itoi, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan**

**Filed Mar. 10, 1980, Ser. No. 128,717**

**Claims priority, application Japan, Mar. 8, 1979, 54-27282; Apr. 25, 1979, 54-51677**

**Int. Cl.**[3] **A01N** *53/00;* **C07C** *121/75*

**U.S. Cl. 424—304** **58 Claims**

**1**. A composition of matter selected from the group consisting of, racemic modification $D_2$, (S)-α-cyano-3-phenoxybenzyl (cis, 1R)-2,2-dimethyl-3-(2,2,2-trichloroethyl) cyclopropanecarboxylate and (R)-α-cyano-3-phenoxybenzyl (cis, 1S)-2,2-dimethyl-3-(2,2,2-trichloroethyl) cyclopropanecarboxylate, and, racemic modification $D_2'$, (S)-α-cyano-3-phenoxybenzyl (trans, 1R)-2,2-dimethyl-3-(2,2,2-trichloroethyl) cyclopropanecarboxylate and (R)-α-cyano-3-phenoxybenzyl (trans, 1S)-2,2-dimethyl-3-(2,2,2-trichloroethyl) cyclopropanecarboxylate, and admixtures thereof.

**51**. A method for the control of pests, comprising applying to the habitat of such pests, a pesticidally effective amount of, racemic modification $D_2$, (S)-α-cyano-3-phenoxybenzyl (cis, 1R)-2,2-dimethyl-3-(2,2,2-trichloroethyl) cyclopropanecarboxylate and (R)-α-cyano-3-phenoxybenzyl (cis, 1S)-2,2-dimethyl-3-(2,2,2-trichloroethyl) cyclopropanecarboxylate, or racemic modification $D_2'$, (S)-α-cyano-3-phenoxybenzyl

(trans, 1R)-2,2-dimethyl-3-(2,2,2-trichloroethyl) cyclopropanecarboxylate and (R)-α-cyano-3-phenoxybenzyl (trans, 1S)-2,2-dimethyl-3-(2,2,2-trichloroethyl) cyclopropanecarboxylate, or admixtures thereof.

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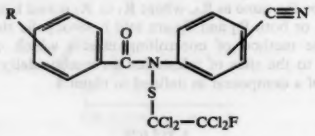
**4,315,030**

## N-HALOALKYL THIOBENZCYANOANILIDES AND THEIR USE AS FUNGICIDES

**Hsiao-Ling M. Chin, and Ferenc M. Pallos, both of Walnut Creek, Calif., assignors to Stauffer Chemical Company, Westport, Conn.**

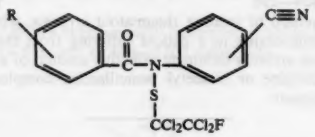
**Filed Jan. 8, 1981, Ser. No. 223,470**
**Int. Cl.³ A01N *37/34;* C07C *121/78***
**U.S. Cl. 424—304** **6 Claims**

1. A compound having the formula



in which R is hydrogen, $C_1$–$C_5$ alkyl, $C_1$–$C_3$ haloalkyl, halogen, —$NO_2$, and $C_1$–$C_2$ alkoxy.

3. A method of controlling fungi comprising applying thereto a fungicidally effective amount of a compound having the formula



in which R is hydrogen, $C_1$–$C_5$ alkyl, $C_1$–$C_3$ haloalkyl, halogen, —$NO_2$, and $C_1$–$C_2$ alkoxy.

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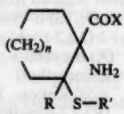
**4,315,031**

## THIOSUBSTITUTED AMINO ACIDS

**Michel Vincent, Bagneux; Georges Remond, Versailles, and Jacques Bure, Neuilly S/Seine, all of France, assignors to Science Union et Cie, Suresnes, France**

**Filed Aug. 28, 1978, Ser. No. 937,151**
**Claims priority, application United Kingdom, Sep. 1, 1977, 36525/77**
**Int. Cl.³ A61K *31/24, 31/95;* C07C *61/39, 69/753***
**U.S. Cl. 424—309** **10 Claims**

1. A cycloalkyl amino acid or ester of the formula



(I)

in which

R is hydrogen or lower alkyl;

R′ is halophenyl, phenyl, phenyl-lower alkyl or halophenyl-methyl;

X is hydroxy or lower alkoxy; and,

n is 0 or an integer from 1 to 3, inclusive.

7. A pharmaceutical composition useful as an immunodepressive agent containing as active ingredient an effective amount of at least one compound of claim 1 or a salt thereof, together with an inert non-toxic pharmaceutically-acceptable excipient or vehicle.

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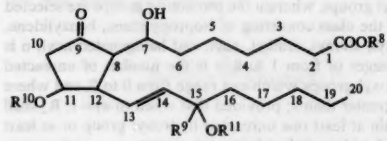
**4,315,032**

## PROCESS FOR PREPARATION OF ADJACENTLY DISUBSTITUTED KETONES

**Ryoji Noyori, Aichi; Masaaki Suzuki, Nagoya, and Seizi Kurozumi, Hino, all of Japan, assignors to Teitin Limited, Osaka, Japan**

**Filed May 14, 1980, Ser. No. 149,584**
**Claims priority, application Japan, May 18, 1979, 54/60293**
**Int. Cl.³ C07C *177/00, 45/69, 45/70, 45/72***
**U.S. Cl. 424—317** **6 Claims**

1. 7-Hydroxyprostaglandine $E_1$, or a stereoisomer thereof, or a protected derivative thereof, having the following formula (5)-c-1



(5)-c-1

wherein $R^8$ represents a hydrogen atom, a methyl group or an ethyl group, $R^9$ represents a hydrogen atom or a methyl group, and $R^{10}$ and $R^{11}$ are identical or different, and each represents a hydrogen atom, a tetrahydropyranyl group or a t-butyldimethylsilyl group.

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**4,315,033**

## METHOD OF TREATING MENOPAUSAL SYMPTOMS

**F. Douglas Lawrason, 53 Spring Valley Rd., Convent Station, N.J. 07960**

**Filed Jan. 22, 1981, Ser. No. 227,354**
**Int. Cl.³ A61K *31/195***
**U.S. Cl. 424—319** **6 Claims**

1. A method of treating vasomotor symptoms associated with menopause in a non-hypertensive female in need thereof which comprises systemically administering methyldopa to said patient in an amount sufficient to effectively ameliorate said symptoms.

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**4,315,034**

## VEGETABLE PROTEIN PRODUCT AND PROCESS

**Arthur A. Levinson, and Kenneth B. Basa, both of Cook, Ill., assignors to National Can Corporation, Chicago, Ill.**

**Continuation of Ser. No. 631,582, Nov. 13, 1975, abandoned, which is a division of Ser. No. 405,201, Oct. 10, 1973, Pat. No. 3,966,977, which is a continuation-in-part of Ser. No. 60,764, Aug. 3, 1970, abandoned. This application Mar. 10, 1980, Ser. No. 128,963**
**Int. Cl.³ A23L *1/20;* A23J *3/00***
**U.S. Cl. 426—104** **49 Claims**

1. A process for producing a proteinaceous food product having an enhanced protein content and the fibrous chewy texture of meat which comprises contacting a compacted, defatted protein-containing seed metal product in shard form characterized by the presence as one portion of the surface thereof of a densified, tough, at least partially denatured skin which is resistant to rehydration; with an aqueous solution having a pH of from about 2 to about 6.5, at temperatures above about 105° C. and at superatmospheric pressure, for a time sufficient to solubilize and extract a proportion of the non-proteinaceous component of said starting material, increase the relative protein content thereof and render the starting material substantially porous, and recovering the product from the resulting liquor.

4,315,035

## COLORANTS FOR LIPID-BASED CONFECTION COMPOSITIONS AND LIPID-BASED COMPOSITIONS MADE THEREFROM

Kenneth B. Basa, Evanston, and Robert G. Agusto, Chicago, both of Ill., assignors to National Can Corporation, Chicago, Ill.

Division of Ser. No. 967,972, Dec. 11, 1978, Pat. No. 4,313,966. This application Nov. 20, 1980, Ser. No. 208,551

Int. Cl.[3] A23L *1/275*

U.S. Cl. 426—250 8 Claims

1. An edible, brown colored, essentially water-free, solid confectionary coating composition comprising an edible lipid; a finely divided sugar; and a highly divided, water soluble, lipid insoluble caramel powder uniformly dispersed as a pigment throughout said coating composition, said caramel powder being present in an amount of from 2 to 6% by weight of said composition.

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4,315,036

## PROCESS FOR DECAFFEINATING TEA

Saeed A. Husaini, Marysville, and Richard T. Liu, Worthington, both of Ohio, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Jan. 12, 1978, Ser. No. 868,938

Int. Cl.[3] A23F *3/38*

U.S. Cl. 426—387 13 Claims

1. Process for decaffeinating a tea extract which contains caffeine and tannins capable of complexing with caffeine comprising:

(a) cooling said extract sufficiently to form

(i) an aqueous solubles phase containing cold-water soluble components of the cooled extract, including a portion of the caffeine, and

(ii) an insolubles phase containing a cold-water-insoluble complex of tannins with another portion of the caffeine;

(b) separating the solubles phase from the insolubles phase;

(c) treating the insolubles phase to remove caffeine therefrom;

(d) adding decaffeinated tannins to the solubles phase; and

(e) repeating steps (a) through (d) until the desired degree of decaffeination has been achieved.

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4,315,037

## PROCESS FOR FORMING A MOLDED ICE CONFECTION

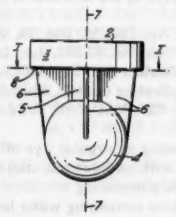
Thomas R. Kelly, Wellingborough, England, assignor to Thomas J. Lipton, Inc., NJ

Filed May 12, 1980, Ser. No. 148,604

Claims priority, application United Kingdom, May 11, 1979, 16418/79

Int. Cl.[3] A23P *1/00*

U.S. Cl. 426—421 8 Claims



1. In a process for forming a molded ice confection which has a protruding or re-entrant shape which comprises filling a moldable confection mix into a thin-walled flexible elastic mold having a cavity corresponding to said protruding or re-entrant shape, freezing to solidfy the ice confection mix in the mold, and withdrawing the solidified confection mix from the mold so as to cause the mold to distort and release its contents, the improvement wherein said thin-walled mold has one or a plurality of openable thin-walled pleats extending along the mold wall from a relatively large distal part of said wall along a relatively narrow more proximal part of said wall and substantially parallel to direction of said withdrawal whereby said pleats gape open during said withdrawal and facilitate release of contents of said relatively large distal part of said ice confection mould.

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4,315,038

## PROCESS FOR PREPARING PROTEIN FLOUR FROM BREWERY WASTE

Phillip M. Townsley, Vancouver, and Robert L. Weaver, Montreal West, both of Canada, assignors to The Molson Companies Limited, Rexdale, Canada

Filed Aug. 20, 1980, Ser. No. 179,820

Claims priority, application Canada, Sep. 4, 1979, 334936

Int. Cl.[3] A23L *1/10;* A23K *1/06;* A23J *1/12*

U.S. Cl. 426—430 6 Claims

1. A process for preparing a flour for use in human food comprising the steps of extracting solid trub with an isopropanolic solvent to remove water and trub resin from the trub, and drying the trub to yield a trub flour.

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4,315,039

## PROCESS FOR PEELING TOMATOES UNDER VACUUM

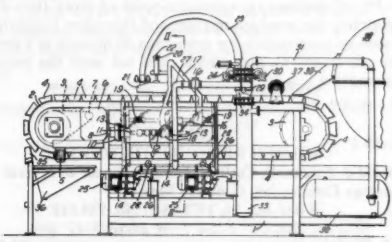
Renzo Levati, Collecchio, Italy, assignor to R. Levati S.p.A., Parma, Italy

Filed Dec. 28, 1976, Ser. No. 755,055

Claims priority, application Italy, Jan. 23, 1976, 46810 A/76

Int. Cl.[3] A23L *1/212;* A23N *7/00*

U.S. Cl. 426—482 2 Claims



1. A process for peeling tomatoes comprising the steps of

scalding said tomatoes to at least partially cook the skins of the tomatoes;

subjecting the scalded tomatoes to a first absolute pressure not exceeding 150 mm Hg by rapidly drawing a vacuum on the tomatoes;

maintaining said first absolute pressure at least momentarily;

further lowering the absolute pressure acting on the tomatoes from said first absolute pressure, to a second absolute pressure in the range of 25–40 mm Hg by further drawing a vacuum on the tomatoes;

then breaking said further vacuum; and

then separating the skins from the tomatoes;

and wherein said process further comprises,

causing the absolute pressure acting on the tomatoes to fluctuate downwardly between said first and second pressures.

4,315,040

## PARTING OIL COMPONENT FOR BAKED GOODS AND PARTING OILS

Christian Heine, Monheim; Uwe Ploog, Haan, and Reinhold Wüst, Kaarst bei Neuss, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Nov. 7, 1979, Ser. No. 92,229

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1978, 2851104

Int. Cl.³ A23D 5/00

U.S. Cl. 426—609 9 Claims

1. A synthetic wax ester useful as a component of parting oils for baked goods consisting of an ester prepared by combining

(a) a mixture of $C_{12}$–$C_{20}$-fatty acids having an iodine number of 48–96 and a content of $C_{16}$–$C_{18}$-fatty acids of at least 90%; with

(b) a mixture of $C_{12}$–$C_{20}$-fatty alcohols having an iodine number of 50–95 and a content of $C_{16}$–$C_{18}$-fatty alcohols of at least 90%, said synthetic wax ester having an iodine number of 40–110; a saponification number of from 100 to 140; an acid number of less than 1; an hydroxy number of 5 or less; and a solidification range of from 10° to 30° C.

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4,315,041

## EMULSIFIER COMPOSITION AND QUALITY IMPROVEMENT METHOD FOR STARCH CONTAINING FOOD

Tetsuro Fukuda, Hirakata; Hideo Matsuura, Toyonaka; Yoshihito Koizumi, Makado, and Takeshi Yamaguchi, Chiba, all of Japan, assignors to Riken Vitamine Oil Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1979, Ser. No. 108,145

Claims priority, application Japan, Nov. 19, 1979, 54-149770; Dec. 7, 1979, 54-159616

Int. Cl.³ A21D 2/16

U.S. Cl. 426—653 4 Claims

1. An emulsifier composition for use in starch containing food which is prepared by melt mixing 80–95% of a distilled monoglyceride composition comprising 65–85% of saturated fatty acid monoglycerides and 35–15% of unsaturated fatty acid monoglycerides and having an iodine value of 10–40, with 20–5% of fats having a melting point of more than 45° C., powdering the resultant mixture and thereafter tempering the powdered composition for more than 30 minutes at a temperature above 45° C. and which does not melt the powdered composition.

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4,315,042

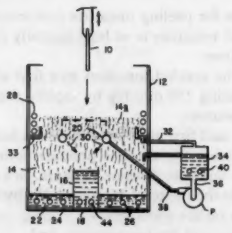
## SOLDER REMOVAL TECHNIQUE

Donald J. Spigarelli, Carlisle, Mass., assignor to Hybrid Technology Corporation, Concord, Mass.

Filed Jul. 14, 1978, Ser. No. 924,518

Int. Cl.³ B23K 1/08; B05D 5/12

U.S. Cl. 427—96 29 Claims




1. A method of solder leveling comprising the steps of forming a zone of saturated vapors from a selected liquid; coating one or more surfaces of an article with solder from a source thereof which is at least partly in said zone of saturated vapors;

positioning said article, one or more surfaces of which have been coated with solder, in said zone of saturated vapors;

maintaining said saturated vapor zone at a substantially constant temperature to provide heat so as to maintain the solder on the one or more surfaces of said article in a molten state;

directing one or more liquid streams of said selected liquid onto the one or more surfaces of said article while said article is positioned in said zone of saturated vapors so as to remove excess molten solder therefrom to provide a leveling of the solder thereon; and

providing said one or more liquid streams at a selected temperature independently of the temperature of the selected liquid which forms the zone of saturated vapors whereby control of the solder removal is effected separately from the heating required to produce the zone of saturated vapors.

15. Apparatus for leveling solder comprising

a treating chamber,

means in said treating chamber for providing a molten bath of solder,

means for maintaining a saturated atmosphere of vapor within a selected region of said treating chamber formed from a selected liquid in said treating chamber,

means for moving an article having one or more surfaces to be coated with solder through said treating chamber in said vapor into said molten bath of solder and for moving said article with one or more surfaces coated with said solder through said vapor, said vapor heating said one or more solder coated surfaces so as to maintain said solder in a molten state,

means in said treating chamber for projecting one or more liquid streams of said selected liquid against one or more solder-coated surfaces of the article when said article is moving through said vapor in said one or more surfaces of the article, said molten bath and said liquid stream projecting means both being within said saturated vapor region, and

means for supplying said selected liquid to said projecting means at a selected temperature independently of the temperature of the selected liquid which forms the zone of saturated vapors whereby control of the solder removal is effected separately from the heating required to produce the zone of saturated vapors.

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4,315,043

## COATING OF GRANULATED ORGANIC DYES WITH AN EPOXY

Joseph E. G. Couture, and Joseph N. A. Roy, both of Ste-Foy, Canada, assignors to Her Majesty the Queen in Right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Continuation of Ser. No. 104,759, Dec. 18, 1979, abandoned, which is a division of Ser. No. 52,302, Jun. 26, 1979, Pat. No. 4,225,368. This application Sep. 22, 1980, Ser. No. 189,113

Claims priority, application Canada, Mar. 2, 1979, 324566

Int. Cl.³ B05D 7/00, 7/24

U.S. Cl. 427—212 9 Claims

1. A method of coating an organic dye of a particle size of 100 to 1000 microns with an inert non-sticking coating comprising an epoxy resin, comprising

(a) providing a reactor containing water heated to the reaction temperature,

(b) introducing said organic dye and said coating material into said reactor,

(c) agitating to form a dispersion of the reactants in water, and

(d) maintaining said reaction temperature and agitation to prevent agglomeration and ensure uniform coating of the dye particles, until the coated dye particles are cured.

## 4,315,044
## STABLE AQUEOUS EPOXY DISPERSIONS

Jimmy D. Elmore, and Joseph L. Cecil, both of Louisville, Ky., assignors to Celanese Corporation, New York, N.Y.

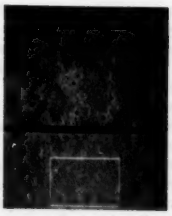
Filed Nov. 5, 1980, Ser. No. 204,101
Int. Cl.³ B05D 3/00; C08L 63/02
U.S. Cl. 427—386 19 Claims

1. A stable epoxy dispersion composition comprising (1) an aqueous medium; and (2) between about 50–70 weight percent of self-emulsifying epoxy resin which is the addition product of reactants comprising (a) 40–90 parts by weight of diglycidyl ether of dihydric phenol, (b) 5–35 parts by weight of dihydric phenol, and (c) 2–15 parts by weight of diglycidyl ether of polyoxyalkylene glycol, wherein the molecular weight of the epoxy resin is in the range between about 500–20,000.

## 4,315,045
## CONDITIONING OF POLYAMIDES FOR ELECTROLESS PLATING

David A. Dillard, Diamond Bar; Eileen Maguire, Arcadia, and Lawrence P. Donovan, Temple City, all of Calif., assignors to Crown City Plating Co., El Monte, Calif.

Continuation-in-part of Ser. No. 970,923, Dec. 19, 1978, abandoned. This application Jun. 16, 1980, Ser. No. 159,585
Int. Cl.³ B05D 3/10
U.S. Cl. 427—307 48 Claims



1. A process for electroless plating of polyamide substrates wherein the substrate is etched with an aqueous acid etch solution prior to electroless plating, the improvement which comprises conditioning the substrate prior to contact with the aqueous acid etch solution by contact with an aqueous alkaline conditioning solution having a pH of at least about 10 and maintained at a temperature of from about 150° F. to the lesser of the boiling point of the solution and the softening temperature of the polyamide substrate for a time sufficient to enhance aqueous acid etch of the polyamide substrate to render the conditioned polyamide substrate substantially uniformly and directly receptive to a metal electroless plating catalyst.

## 4,315,046
## PROCESS FOR SECURING PRIMERLESS ADHESION OF SILICONE RESIN COATING COMPOSITION TO CAST ACRYLICS

Robert B. Frye, Albany, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jul. 17, 1980, Ser. No. 169,651
Int. Cl.³ B05D 3/00
U.S. Cl. 427—322 7 Claims

1. In process for forming an adherent, abrasion-resistant coating on unprimed cast acrylic substrate, the steps comprising:

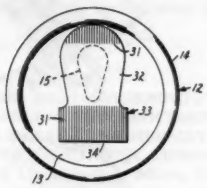
(i) applying to said substrate a wash coating of glacial acetic acid and draining said wash coating for from 2 to 5 minutes.

(ii) thereafter applying a coating composition comprising a dispersion of colloidal silica in an aliphatic alcohol-water solution of the partial condensate of a silanol of the formula $RSi(OH)_3$, wherein R is selected from the group consisting of alkyl having from 1 to 3 carbon atoms and aryl, at least 70 weight percent of the silanol being $CH_3Si(OH)_3$, said composition containing 10 to 40% solids, said solids consisting essentially of 10 to 70 weight % colloidal silica and 30 to 90 weight % of the partial condensate and wherein said composition has a pH of from 7.1 to about 7.8.

## 4,315,047
## CURLED TAPE, ROLL, AND CONTAINER END

Thomas W. Seabold, St. Paul; Richard A. Patterson, Woodbury, and Richard P. de Neui, Lake Elmo, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 121,661, Feb. 15, 1980, abandoned. This application Sep. 19, 1980, Ser. No. 188,671
Int. Cl.³ B32B 3/02
U.S. Cl. 428—64 12 Claims




1. A tape comprising a backing and a pressure-sensitive adhesive layer wherein said backing of said tape is deformed in uniformly spaced, localized areas to impart at least a temporary curl to said tape.

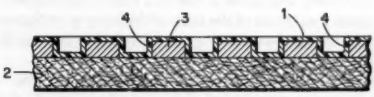
11. An article of manufacture comprising a container end having at least one preformed opening, said preformed opening sealed with the tape of claim 1.

12. A convolutely wound roll of the tape of claim 1, wherein said adhesive layer is exposed on the outside of said roll.

## 4,315,048
## COMPOSITE STRUCTURES BASED ON POLYOLEFIN FIBERS AND PROCESS FOR MAKING SAME

Benito Beghelli, Monza; Vincenzo De Angelis, Terni, and Mauro Navone, Milan, all of Italy, assignors to Merak S.p.A., Milan, Italy

Filed Mar. 11, 1980, Ser. No. 129,356
Claims priority, application Italy, Mar. 12, 1979, 20896 A/79
Int. Cl.³ B32B 3/14
U.S. Cl. 428—78 4 Claims




1. A composite structure comprising:

(a) a layer of fibers comprising polyolefin fibers and which is in the form of a fabric, a non-woven fabric, a mat, or a carpet;

(b) an unoriented polyolefin film having a thickness of 50 to 2,500 microns; and

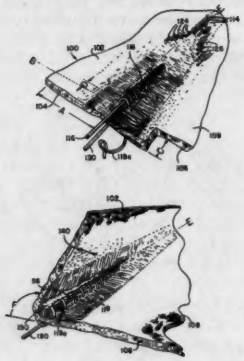
(c) interposed between the fiber layer and the polyolefin film, a reinforcing element selected from the group consisting of metal foils, metal nets, stiff plastic sheets, paperboard and structures comprising glass fibers, said reinforcing element having smaller dimensions than the fiber layer and being provided with a plurality of holes through which the polyolefin film contacts the fiber layer and is heat-set to it.

4,315,049

## STITCHLESS LOW BULK, PIN-TYPE SEAM FOR USE IN PAPER MAKING EQUIPMENT FABRICS, SUCH AS DRYER FELTS

Gisela Fickers, Eupen, Belgium, assignor to Asten Group, Incorporated, Devon, Pa.

Continuation-in-part of Ser. No. 100,946, Dec. 6, 1979. This application Apr. 28, 1980, Ser. No. 144,444
Int. Cl.[3] D21F *7/10;* D03D *25/00*
U.S. Cl. 428—104 22 Claims



1. A method of producing a low bulk, stitchless pin-type seam in a multi-ply fabric for use with paper making equipment, comprising the steps of:

(a) providing a length of fabric to be seamed comprising a plurality of longitudinal warp yarns interwoven with at least two ply-forming layers of transverse pick yarns, said layers defining at least front and back plys, said length of fabric being of a length which is longer than the desired seamed fabric length;

(b) removing preselected pick yarns to create apertures in said fabric and define a fold line which corresponds to the fabric end of one of the sides of the seam to be formed, said fold line further defining adjacent fabric body and fabric overlap regions on said fabric;

(c) installing a seaming coil through said apertures;

(d) removing preselected pick yarns from said back ply of said fabric in said fabric body and fabric overlap regions adjacent said coil;

(e) applying a bead of adhesive along said fold line;

(f) folding at least a portion of said overlap region at said fold line to overlap said fabric body region to form a seaming edge defined by said coil;

(g) creating a warp yarn fringe on a portion of said fabric overlap region which is remote to said seam overlap area;

(h) drawing at least portions of said warp yarn fringe between yarns in said fabric body region to complete a first half of said coil seam; and

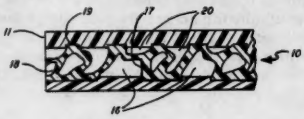
(i) performing at least steps (b) through (h) with respect to a different fabric position whereby a second half of said coil seam is formed to matingly receive said first half to define a pin receiving channel.

4,315,050

## LAMINATES STRUCTURE OF AN EXPANDED CORE PANEL AND A FLAT SHEET OF MATERIAL WHICH DOES NOT EASILY BOND AND A PROCESS FOR MAKING THE SAME

Rosemary Rourke, Newton, Conn., assignor to Norfield Corporation, Danbury, Conn.

Filed Jan. 25, 1980, Ser. No. 115,338
Int. Cl.[3] B32B *3/12;* B29C *27/12*
U.S. Cl. 428—116 14 Claims



1. A method of forming a composite member having a panel of expanded thermoformable material with a plurality of voids, as a core and at least one sheet of the same material attached thereto, comprising the steps of:

disposing at least one face portion of a layer of expanded thermoformable material adjacent to a face portion of a layer of a sheet of same material;

disposing the layers between two platens of a press;

heating at least one platen adjacent to the sheet of the same material to its melting temperature at the point of contact between said layers;

moving said presses together thereby squeezing material from the sheet of the same material into voids of said expanded thermoformable material;

cooling said at least one platen; and

removing said composite member from said platnes.

10. A composite member comprising:

a panel of expanded thermoformable material having a plurality of voids, each of said voids having an opening on at least one surface of said expanded panel, said opening having an area smaller than an interior cross sectional area of said void; and

at least one layer of hard to bond thermoformable material attached to said panel and having a plurality of projections into said voids, and each of said projections having a cross sectional area at the interior of said voids which is greater than the area of said openings made by the method of claim 1.

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4,315,051

## PROCESS FOR EXPANDING THERMOFORMABLE MATERIALS HAVING CLEAR SURFACES AND THE RESULTANT PRODUCTS

Rosemary Rourke, Webster Pl., Newtown, Conn. 06470

Filed Jan. 25, 1980, Ser. No. 115,336
Int. Cl.[3] B32B *3/12;* B29C *17/02*
U.S. Cl. 428—119 10 Claims

1. A method of forming an expanded panel of thermoformable material, in such a manner that said panel will have a flat smooth side comprising:

disposing between a flat solid platen and a vented platen, a sheet of thermoformable material;

placing between the sheet of thermoformable material and the flat solid platen a film layer of plastic material which does not bond to said thermoformable material but which exhibits hot tack adhesion at an elevated temperature;

bringing the platens together so as to press against said sheet of thermoformable material and film layer;

heating said platens to a temperature at which both the thermoformable material and the film layer exhibit hot tack adhesion;

moving the platens apart so as to expand the thermoformable material into an expanded panel;

cooling the expanded panel, removing the expanded panel from between the platens; and

stripping the film layer from said expanded panel.

8. An expanded panel of thermoformable material having a smooth side formed in accordance with the method claim 1.

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## 4,315,052
## MAGNETIC RECORDING MEDIUM

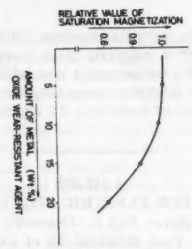
**Noboru Takahashi; Sadao Ozaki; Hiromasa Isono; Toshikazu Nishihara; Takeshi Ikushima, and Tunehide Naruse, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan**

**Filed Jun. 23, 1980, Ser. No. 162,092**

**Claims priority, application Japan, Jun. 26, 1979, 54-79749**

**Int. Cl.³ G11B *5/70***

**U.S. Cl. 428—328** **4 Claims**




1. A magnetic recording medium comprising a suport and a magnetic recording layer formed on said support and comprised of a magnetic powder of a metal or alloy, about 2.0 to 20 wt % of an abrasion-resistant metal oxide, about 1.0 to 10 wt % of ethylene stearyl bisamide and about 10 to 25 wt % of an organic resin binder, all based on said magnetic metal powder.

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## 4,315,053
## BASE COATS COVERED BY A CLEAR LACQUER COATING AND PROCESS FOR COATING

**Ulrich Poth, Münster; Dieter Möller, Ascheberg, and Arnold Dobbelstein, Cologne, all of Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Hamburg, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 124,570, Feb. 25, 1980, abandoned, which is a continuation of Ser. No. 12,723, Feb. 16, 1979, abandoned. This application May 28, 1980, Ser. No. 153,852**

**Claims priority, application Fed. Rep. of Germany, Feb. 16, 1978, 2806497**

**Int. Cl.³ B32B *15/08;* B44D *1/14***

**U.S. Cl. 428—423.7** **14 Claims**

1. In an article having a substrate and a multilayer coating composition adhered thereto, said composition comprising:

A. a dried nonaqueous base film produced from a composition comprising:

1. a first film-forming material selected from the group consisting of alkyd resins, polyester resins, acrylic resins, and polyurethane resins, wherein said first film-forming material contains from about 2 to about 50 weight percent, based on the film-forming solids, of a cellulose ester,

2. uniformly dispersed pigments, and

3. volatile organic solvents for said first film-forming material, and

B. a baked transparent coating composition deposited on said base film in a relationship to maintain substantially no intermixing and no intersolution of said base film and said transparent coating composition, said transparent coating composition comprising:

1. a second film-forming material selected from the group consisting of alkyd resins, polyester resins, acrylic resins and polyurethane resins, and

2. volatile organic solvents for said second film-forming material, the improvement comprising:

said second film-forming material consisting essentially of polyester resins comprising a crosslinking resin containing hydroxyl groups obtained by esterifying polycarboxylic acids selected from the group consisting of aliphatic polycarboxylic acids, cycloaliphatic polycarboxylic acids, and mixtures thereof with polyols selected from the group consisting of aliphatic polyols, cycloaliphatic polyols and mixtures thereof.

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## 4,315,054
## CRACK-RESISTANT, HEAT-ABSORBING FUSION GLASSES ENABLING LOW PROCESSING TEMPERATURES FOR THE HERMETIC ENCAPSULATION OF ELECTRONIC COMPONENTS

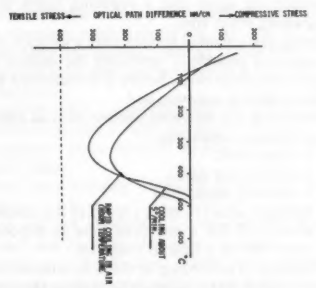
**Werner Sack, and Otto Lindig, both of Mainz, Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany**

**Filed Jul. 30, 1980, Ser. No. 173,799**

**Claims priority, application Fed. Rep. of Germany, Jul. 30, 1979, 2930912**

**Int. Cl.³ C03C *3/04, 3/10***

**U.S. Cl. 428—433** **3 Claims**




1. A fusion glass of the series $SiO_2$—$Al_2O_3$—$Na_2O$—PbO—$Fe_3O_4$ consisting essentially of 43.0–46.2% by weight of $SiO_2$; 1.0–2.0% by weight of $Al_2O_3$; 6.2–16.0% by weight of $Na_2O$ which is the only alkali metal oxide; 33.0–46.1% by weight of PbO; 2.0–4.5% by weight of $Fe_3O_4$; and a maximum of 0.2% by weight of $Sb_2O_3$, all calculated as percent by weight of oxide; the glass being heat absorbing, having a softening temperature of 537°–601° C., and fusing to metallic electronic conductor contacts in a hermetic seal at low fusion processing temperatures of 763°–879° C. whereby minimal vaporization of glass components occurs, the encapsulated metallic contacts so produced having stresses between the metallic conductor and the fusion glass, which upon subjection to rapid cooling in air or to cooling at 5° C./min, are characterized by a maximum tensile stress corresponding to an optical path difference of ≦400 nm/cm, at a specific birefringence of $(2.7\pm0.1)\times10^{-6}$ mm²/N, said metallic contacts having a coefficient of thermal expansion at 20°–300° C. of $8.4–12.2\times10^{-6}$/°C. and a maximum heat absorption at 1 to 1.5 μm.

2. A metallic, electronic conductor contact encapsulated in a fusion glass of claim 1.

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4,315,055

## DIRECT ELECTROLESS DEPOSITION OF CUPROUS OXIDE FILMS

J. Shannon Breininger, Gibsonia, and Charles B. Greenberg, Murrysville, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 755,369, Dec. 29, 1976, abandoned. This application Jun. 30, 1980, Ser. No. 164,110

The portion of the term of this patent subsequent to Oct. 9, 1996, has been disclaimed.

Int. Cl.³ B32B 17/06; C03C 17/36

U.S. Cl. 428—434 8 Claims

1. A wet chemical method for the direct deposition of a film consisting essentially of cuprous oxide onto a surface of a glass substrate comprising the steps of:

(a) cleaning a surface of the substrate;

(b) rendering said surface receptive to electroless deposition of a coating; and

(c) contacting the receptive surface with an electroless plating solution comprising:

(1) a copper salt;

(2) a complexing agent;

(3) a reducing agent; and

(4) sufficient alkali to bring the pH of the solution to at least about 12.9

for a sufficient time to deposit a cuprous oxide film of a desired thickness.

3. A wet chemical method for the direct deposition of a film consisting essentially of cuprous oxide onto a surface of a glass substrate comprising the steps of:

a. cleaning a surface of the substrate;

b. rendering said surface receptive to electroless deposition of a coating by contacting the surface with a silver salt, a complexing agent and a reducing agent to deposit an activating silver film;

c. rinsing the activated surface with a solution of a chemical compound capable of rendering the surface substantially free from silver oxide before it is contacted with an electroless plating solution; and

d. contacting the activated surface with an electroless plating solution comprising;

1. a copper salt;

2. a complexing agent;

3. a reducing agent; and

4. sufficient alkali to bring the pH of the solution to at least about 12.9 for a sufficient time to deposit a cuprous oxide film of a desired thickness.

4. The method according to claim 3, wherein the activated surface is rinsed with a solution of sodium thiosulfate.

5. The method according to claim 4, wherein the activated surface is contacted with an electroless plating solution

wherein said copper salt is copper sulfate;

said reducing agent is formaldehyde;

said complexing agent is Rochelle Salt; and

said alkali is alkali metal hydroxide.

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4,315,056

## LOW TIN TERNE COATED STEEL ARTICLE

Marvin B. Pierson, Franklin, and Frank C. Dunbar, Monroe, both of Ohio, assignors to Armco Inc., Middletown, Ohio

Continuation of Ser. No. 793,624, May 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 730,622, Oct. 7, 1976, abandoned, which is a continuation of Ser. No. 499,917, Jul. 22, 1974, abandoned. This application Feb. 4, 1980, Ser. No. 118,073

Int. Cl.³ B32B 15/04, 15/18; C23C 1/06

U.S. Cl. 428—645 3 Claims

1. A jet finished, hot dipped, terne coated, steel article having improved solderability and appearance, the coating consisting of about 2% tin to about 6.5% tin and the balance lead, with no other purposeful additions, and including only impurities normally present, in an amount less than 1%, the weight of the coating being from about 0.5 oz/ft.$^2$(15.2g/m$^2$), through the entire range of commercial coating weights and being the only metallic coating on said article.

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4,315,057

## MAGNETIC RECORDING MEDIUM

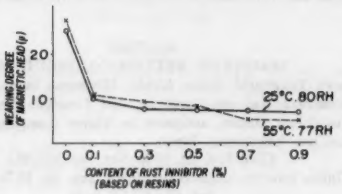
Eiji Horigome; Hitoshi Azegami, and Hiroshi Ohta, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Oct. 1, 1980, Ser. No. 192,697

Claims priority, application Japan, Oct. 9, 1979, 54/129424

Int. Cl.³ H01F 10/02; B05D 5/12

U.S. Cl. 428—694 3 Claims




1. In a magnetic recording medium which comprises a substrate coated with a magnetic layer comprising a magnetic powder, a resinous binder and a rust inhibitor, the improvement of the rust inhibitor comprising benzotriazole or benzodiazole at a ratio of more than 0.1 wt. % based on resins of the binder.

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4,315,058

## VENT PLUGS FOR ELECTRIC STORAGE BATTERIES

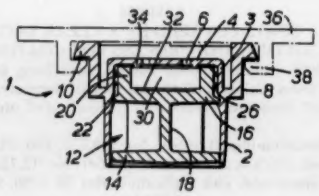
Derek K. Schwendener; Neil L. Ainsworth, both of Billericay, and Richard J. Foss, Rainham, all of England, assignors to Chloride Group Limited, London, England

Filed May 6, 1980, Ser. No. 147,319

Claims priority, application United Kingdom, May 9, 1979, 16115/79

Int. Cl.³ H01M 2/12

U.S. Cl. 429—84 15 Claims




1. A vent plug for an electric storage battery comprising:

a tubular body for insertion in an aperture in a lid of said battery;

said vent plug further comprising an upper end portion integral with said tubular body;

a lid integrally formed within said upper end portion of said vent plug wherein at least one aperture is formed within said upper end portion for venting gas from said vent plug;

a removable insert secured within said tubular body and at least partially defining a gas venting path, said insert and said body defining a space with which said at least one gas venting aperture and said gas venting path communicate; and

a porous flame retarding body disposed within said space, said flame retarding body being retained in position by

said removable insert such that said flame retarding body may be readily removed from said vent plug.

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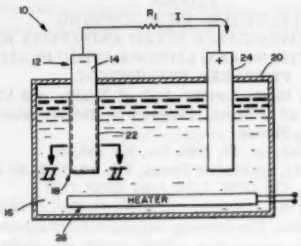
4,315,059

## MOLTEN SALT LITHIUM CELLS

Ian D. Raistrick, Menlo Park; Jaime Poris, Portola Valley, and Robert A. Huggins, Stanford, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 18, 1980, Ser. No. 170,254
Int. Cl.³ H01M 6/36
U.S. Cl. 429—112 20 Claims




1. In an electrochemical cell having a first electrode, a second electrode spaced from said first electrode, and an electrolyte contacting said second electrode, said first electrode including lithium as an electroactive species thereof, the improvement comprising:
said electrolyte including nitrate moieties; and,
means for permitting conduction of lithium in an ionic form between said electrolyte and said first electrode while substantially isolating said first electrode from said electrolyte.

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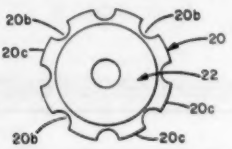
4,315,060

## METAL SUBSTRATE FOR AN ELECTROCHEMICAL CELL

Franz Goebel, Sudbury, and William T. McHugh, Westwood, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 13, 1980, Ser. No. 159,267
Int. Cl.³ H01M 6/00
U.S. Cl. 429—122 8 Claims




1. A metal current collector substrate adapted to be inserted into an elongated housing of an electrochemical cell and to make direct physical contact with an interior wall of the housing, said current collector substrate comprising:
a thin, solid, resilient disc of a non-permeable metal and having a plurality of like cut-out openings spaced about its entire periphery in a predetermined pattern and defining a plurality of deflective, resilient peripheral portions intermediate to the openings, said disc further having a single additional opening therein spaced from the plurality of other openings and encircled by the material of the disc, and said disc being normally flat prior to insertion into the housing of an electrochemical cell and having a size prior to insertion into the housing of the cell greater than the interior cross section of the housing, by an amount such that the peripheral portions of said disc operate when the disc is inserted into the housing to be deflected upwardly by physical contact with the interior wall of the housing and to move toward each other thereby to cause the disc to generally conform to the interior cross section of the housing, said peripheral portions following the deflection thereof being at acute angles with respect to the interior wall of the housing and making direct physical contact with the interior wall of the housing and establishing a plurality of passageways adjacent to the interior wall of the housing as a result of the plurality of openings to the interior wall of the housing.

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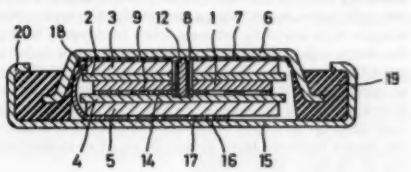
4,315,061

## BATTERY WITH INTERNAL ELECTRICAL CONNECTORS

Hironosuke Ikeda, Hirakata; Satoshi Narukawa, and Shigehiro Nakaido, both of Kobe, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jun. 12, 1980, Ser. No. 158,781
Claims priority, application Japan, Jun. 25, 1979, 54-87181[U]; Nov. 2, 1979, 54-152639[U]; Jan. 17, 1980, 55-4138[U]; May 9, 1980, 55-64137[U]
Int. Cl.³ H01M 2/26
U.S. Cl. 429—161 16 Claims




1. A battery comprising:
a first electrode plate having a first polarity;
a second electrode plate located on one side of the first electrode plate and having a second polarity;
a first separated layer disposed between said first and second electrode plates;
a third electrode plate on another side of the first electrode plate and having said second polarity;
a second separator layer disposed between the first and third electrode plates;
a first outer case forming a battery terminal of the first polarity;
a collector element electrically connecting the first electrode plate and the first outer case together;
a first insulating layer disposed immediately adjacent the first outer case, the second electrode plate and the collector element in a manner that an internal battery connection to the first outer case through the collector element is permitted while all other internal battery connections to the first outer case are prevented; and
a second outer case forming a battery terminal of the second polarity, the second outer case being electrically connected to the second and third electrode plate and being electrically insulated from the first outer case.

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4,315,062

## METHOD FOR THE MANUFACTURE OF A POLYSTYRENE SEPARATOR AND CELL

Donald M. Clarizio, Yonkers, N.Y., assignor to Duracell International Inc., Bethel, Conn.

Filed Jan. 16, 1978, Ser. No. 870,049
Int. Cl.³ H01M 2/16
U.S. Cl. 429—246 11 Claims

1. A method of forming a separator for use in an electrochemical cell comprising the steps of dissolving polystyrene resin in a solvent, placing a predetermined amount of the resulting polystyrene solution directly on the exposed surface

of a cathode, and removing said solvent thereby leaving a thin, substantially continuous coating on the exposed surface of said cathode.

11. An electrochemical cell comprising an anode, a cathode and a polystyrene separator formed by the method of claim 1, said separator being positioned between and completely separating said cathode and said anode whereby it prevents the migration therethrough of reaction products of said cathode and said anode.

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## 4,315,063
## ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER HAVING A HALOGEN CONTAINING CHARGE INJECTION LAYER

**Tadaji Fukuda, and Teruo Misumi, both of Toride, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 9, 1978, Ser. No. 959,005**
**Claims priority, application Japan, Nov. 17, 1977, 52-138204**
**Int. Cl.³ G03G *5/10, 5/14***
**U.S. Cl. 430—65** **8 Claims**

1. An electrophotographic photosensitive member comprising an electric charge injection layer from 1 to 10 microns in thickness, an amorphous photoconductive layer from 25 to 75 microns in thickness on said charge injection layer, and an insulating layer on said amorphous photoconductive layer, said charge injection layer being a semiconductive layer containing halogen as an impurity; wherein when the layer to be joined to the charge injection layer employs a p-type semiconductor, the work function of the charge injection layer should be equal to or greater than that of the material used for the layer to be joined; and when the layer to be joined to the charge injection layer employs an n-type semiconductor, the work function of the charge injection layer should be equal to or smaller than, that of the layer to be joined.

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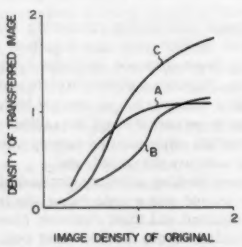
## 4,315,064
## ELECTROSTATIC PHOTOGRAPHIC COPYING PROCESS

**Nobuhiro Miyakawa, Kobe, and Takashi Teshima, Amagasaki, both of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan**

**Filed Nov. 28, 1979, Ser. No. 98,215**
**Claims priority, application Japan, Nov. 28, 1978, 53/145967**
**Int. Cl.³ G03G *13/09***
**U.S. Cl. 430—122** **11 Claims**




1. An electrostatic photographic copying process comprising causing a substrate carrying an electrostatic latent image thereon to fall in contact with a magnetic brush of a one-component type magnetic developer to effect development of the electrostatic latent image and electrostatically transferring the formed image of the developer onto a transfer sheet, wherein the magnetic developer comprises a resin medium and a finely divided magnetic material dispersed therein, the resin medium comprising a copolymer comprising (a) at least one aromatic vinyl monomer and (b) at least one mono- or di-ethylenically unsaturated monomer other than the aromatic vinyl monomer, the amount of the finely divided magnetic material being 45 to 65% by weight based on the total developer, the amount of said copolymer being 30 to 120% by weight based on the finely divided magnetic material, said magnetic developer being prepared by melt-kneading the mixture of the resin medium and the finely divided magnetic material and cooling the kneaded composition and pulverizing the cooled composition, said magnetic developer having an electrostatic capacity of 7.8 to 9.32 PF (picofarad) as determined under conditions of an electrode spacing of 0.65 mm, an electrode sectional area of 1.43 $cm^2$ and an electrode load of 105 $cm^2$, and a dielectric constant of 4 to 4.78 and a volume resistivity of at least $5\times10^{13}$ Ω-cm, as determined under the above conditions.

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## 4,315,065
## OLEOPHILIC, FILM-FORMING PHOTOPOLYMERIZABLE DIAZO AND EPOXY RESIN COMPOSITIONS AND LITHOGRAPHIC PLATES PREPARED THEREFROM

**Marcel Pigeon; Marta Szretter, both of Neuilly, and Chantal Perie, Paris, all of France, assignors to Rhone-Poulenc Systemes, Cedex, France**

**Filed Apr. 16, 1980, Ser. No. 140,847**
**Claims priority, application France, Feb. 11, 1980, 80 02966**
**Int. Cl.³ G03C *1/54, 1/60;* G03F *7/08***
**U.S. Cl. 430—175** **14 Claims**

1. An oleophilic, film-forming, organic-solvent soluble photopolymerizable composition, which consists essentially of:

(a) from about 30% to 70% by weight of a condensation product of paradiazodiphenylamine fluoroborate with a reactive carbonyl group-containing organic condensation agent and;

(b) from about 70% to 30% by weight of a monomer or prepolymer epoxy resin or mixture thereof, which is fluid at ambient temperature and which has an epoxy equivalent of less than about 350, a Durran melting point of about 38° C. or less and a viscosity of at least about 5,000 cps at 25° C.; said composition being capable, when in coated layer form, of development with an aqueous developing solution containing an acid and a wetting agent.

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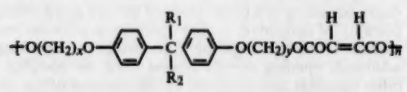
## 4,315,066
## SUBSTRATES SUITABLE FOR THE PRODUCTION OF PHOTOPOLYMERIZABLE ELEMENTS

**Stuart G. Lambert, Colchester, England, assignor to Bexford Limited, London, England**

**Filed Jun. 25, 1979, Ser. No. 51,409**
**Claims priority, application United Kingdom, Mar. 29, 1979, 10062/79; Jun. 6, 1979, 19769/79**
**Int. Cl.³ G03C *1/78***
**U.S. Cl. 430—271** **8 Claims**

1. A substrate suitable for the production of a photopolymerisable element, comprises a self-supporting plastic film or plastic sheet having an adhesive layer superimposed upon at least one surface thereof, wherein the adhesive layer comprises an adhesive component consisting essentially of an unsaturated resin having the formula:



wherein $R_1$ and $R_2$ are the same or different and represent lower alkyl groups having up to 6 carbon atoms, x and y are the same or different and are an integer from 1 to 4 inclusive and n is an integer from 4 to 30 inclusive.

4,315,067

## METHOD FOR MAKING ELECTRON SENSITIVE NEGATIVE RESIST

Maryse Gazard; Armand Eranian; Francoise Barre, and Claude Duchesne, all of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 57,089, Jul. 12, 1979, abandoned, which is a continuation of Ser. No. 798,169, May 18, 1977, abandoned. This application Jul. 9, 1980, Ser. No. 167,036

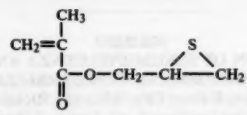
Claims priority, application France, May 21, 1976, 7615520

Int. Cl.[3] G03C *1/71*

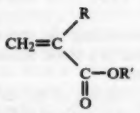
U.S. Cl. 430—296 12 Claims

1. A method for preparing an electron sensitive negative resist which comprises:

contacting a substrate with a solution comprising a solvent and a copolymer having units of the formula (I)



and units of formula (II):



wherein R is H or a $C_1$–$C_{10}$ alkyl group, and R′ is a $C_1$–$C_5$ alkyl group, and wherein said units of formula (II) are present in a proportion of 15–65% of said copolymer;

removing said solvent to thereby deposit said copolymer on said substrate; and

irradiating said copolymer with a beam of electrons for a time sufficient to absorb a charge density of between $10^{-3}$ and $5\times10^{-3}$ coulombs/sq. meters.

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4,315,068

## PHOTO-SENSITIVE AND HEAT-SENSITIVE COMPOSITION AND RECORDING ELEMENT USING SAME

Makoto Kunikane, Chigasaki; Masaakira Umehara, Yokohama; Koji Uji-Ie, Hino, and Kiyoshi Taniguchi, Yokohama, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

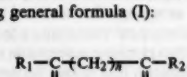
Filed Jan. 28, 1981, Ser. No. 229,216

Claims priority, application Japan, Feb. 5, 1980, 55-12629; May 15, 1980, 55-63411; May 28, 1980, 55-70945

Int. Cl.[3] G03C *5/24, 1/00*

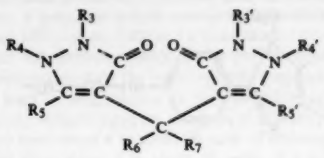
U.S. Cl. 430—341 48 Claims

1. A photo-sensitive and heat-sensitive composition which comprises (a) a photooxidant, (b) a color-generator generating color when oxidized, (c) an acid promoting said color generation, (d) a cobalt (III) amine and/or amine complex, (e) a photoreductant, (f) a hydrogen donator, (g) at least one kind of chelating agent selected from dioxime chelating agents having the following general formula (I):



(I)

(wherein n is an integer of 0 to 3, and $R_1$ and $R_2$ can each represent an alkyl, aryl or aralkyl group) and diantipyrylmethane chelating agents having the following general formula (II):



(II)

(wherein $R_3$, $R_4$, $R_5$, $R_3'$, $R_4'$ and $R_5'$ can each represent a hydrogen atom and an alkyl or aryl group, and $R_6$ and $R_7$ can each represent a hydrogen atom and an alkyl, substituted or non-substituted aryl or aralkyl group), and (h) at least one kind of stabilizer selected from noble metal complexes, organic oxidants and organic acids.

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4,315,069

## COLOR COUPLER COMBINATION

John G. V. Scott, Maldon, and Anthony K. Harvey, Stisted, Nr. Braintree, both, England, assignors to Ciba Geigy AG, Basel, Switzerland

Filed Sep. 11, 1980, Ser. No. 186,098

Claims priority, application United Kingdom, Sep. 18, 1979, 32291/79

Int. Cl.[3] G03C *7/00, 1/40*

U.S. Cl. 430—365 31 Claims

1. Photographic silver halide material for preparing a monochromatic dye image by a chromogenic process which material comprises in at least one silver halide emulsion layer a colour coupler which couples with oxidized colour developer of aromatic primary amino type to produce a yellowish dye which absorbs light in the region of from 350 to 560 nm, a more reactive coupler compound which reacts with oxidized colour developer of the primary amino type to yield a dye of which the absorption is predominantly above 560 nm, and optionally further colour couplers, the ratio of coupler which produces a yellowish dye to more reactive coupler being from 10:0.1 to 10:2.0, the parts being by weight.

30. A process for the preparation of a monochromatic dye image which comprises imagewise exposing the photographic silver halide material as claimed in claim 1, colour developing the exposed material using a colour developing solution which comprises an aromatic primary amino colour developing agent, bleaching the thus formed silver image to yield a monochromatic dye image.

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4,315,070

## COLOR-PHOTOGRAPHIC RECORDING MATERIAL CONTAINING A HIGHLY REACTIVE DIR-COUPLER

Erwin Ranz, Leverkusen; Joachim W. Lohmann, Odenthal, and Heinz-Dieter Schütz, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

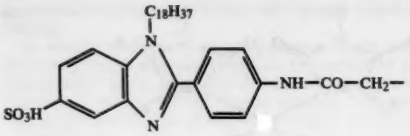
Continuation of Ser. No. 16,954, Mar. 2, 1979, abandoned. This application Jun. 12, 1980, Ser. No. 158,990

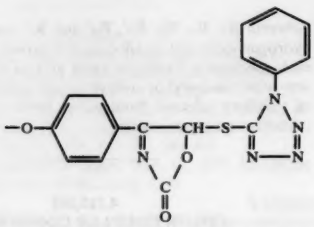
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1978, 2853362

Int. Cl.[3] G03C *1/40*

U.S. Cl. 430—505 3 Claims

1. In a color photographic recording material comprising at least three differently spectrally sensitized light sensitive silver halide emulsion layer units which have non-diffusing color couplers associated therewith, and non-light-sensitive binder layers, the improvement according to which in at least one of the light-sensitive and light-insensitive layers of the recording material is associated with a DIR coupler compound corresponding to the following formula:





said DIR coupler having an effective reaction velocity constant $k_{eff}$ of more than 20,000 ($mole^{-1}.sec^{-1}$.) in a concentration of from $10^{-5}$ to $10^{-3}$ mole per mole of silver halide in the same layer or in a concentration of from $10^{-7}$ to $10^{-5}$ mole per gram of solids in the case of a silver-halide-free binder layer adjacent to a silver halide emulsion layer.

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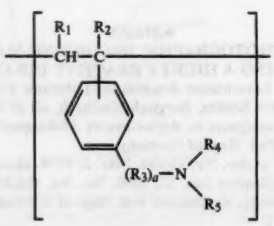
**4,315,071**

## POLYSTYRYL AMINE POLYMERIC BINDERS FOR PHOTOGRAPHIC EMULSIONS

**Maurice J. Fitzgerald, Canton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Mar. 30, 1981, Ser. No. 249,000**
**Int. Cl.³ G03C *1/02***
**U.S. Cl. 430—627** **10 Claims**

**1.** A photosensitive silver halide emulsion comprising silver halide crystals disposed in an emulsion binder comprising a styryl amine polymer with repeating units having the general formula:



wherein:

$R_1$ is hydrogen, lower alkyl or halogen; $R_2$ is hydrogen, lower alkyl halogen, or cyano; $R_3$ is lower alkylene or cycloalkylene; a is either 0 or 1; and $R_4$ and $R_5$ are independently selected from hydrogen, lower alkyl, lower cycloalkyl, lower nitrogen-containing heterocyclic or phenyl; with the proviso that $R_3$ and/or $R_4$ and/or $R_5$ may be chemically joined to form a 3 to 8 membered heterocyclic ring structure.

**4,315,072**

## ARTIFICIAL GELATINS OF HIGH METHIONINE CONTENT FOR PHOTOGRAPHIC FILM

**Sidney W. Fox, and Arthur I. Holden, both of Miami, Fla., assignors to Polymicro, Miami, Fla.**

**Filed Mar. 11, 1980, Ser. No. 129,351**
**Int. Cl.³ G03C *1/06, 1/72;* G03F *5/00***
**U.S. Cl. 430—628** **8 Claims**

**1.** A photographic emulsion, comprising a silver halide and a polyimide condensation product of methionine and at least one other α-amino carboxylic acid, wherein the molar percent of methionine is greater than the molar percent of methionine in natural gelatin.

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**4,315,073**

## TITRATION OF SERUM INFLUENZA ANTIBODY USING PLAQUE REDUCTION NEUTRALIZATION TEST

**Karen K. Brown, Kansas City, Mo., and Richard C. Stewart, Merriam, Kans., assignors to Cutter Laboratories, Inc., Berkeley, Calif.**

**Filed Oct. 26, 1979, Ser. No. 88,684**
**Int. Cl.³ C12Q *1/70;* G01N *33/54***
**U.S. Cl. 435—5** **25 Claims**

**1.** A method of determining the titer of anti-infective antibodies to influenza virus in a blood serum sample, the method comprising the steps of:

(a) preparing serial dilutions of the serum sample;

(b) reacting each dilution with an indicator infuenza virus to form separate dilution products;

(c) inoculating separate influenza virus susceptible monolayer cell cultures with the separate dilution products;

(d) providing an overlay for the inoculated cultures;

(e) incubating the cultures in the presence of a protein hydrolyzing enzyme under conditions sufficient to allow plaque formation;

(f) counting the plaques in each culture and relating the counts to a standard to determine the antibody titer.

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**4,315,074**

## MOLECULAR TRANSFORMATION PROCEDURE

**Garfield P. Royer, Worthington, Ohio, assignor to Pierce Chemical Company, Rockford, Ill.**

**Division of Ser. No. 907,503, May 19, 1978, Pat. No. 4,182,654, and a continuation-in-part of Ser. No. 680,462, Apr. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 507,198, Sep. 18, 1974, abandoned. This application Jun. 22, 1979, Ser. No. 51,229**
**Int. Cl.³ C12P *21/02, 21/00***
**U.S. Cl. 435—70** **12 Claims**

**1.** A process for synthesizing a peptide chain having a distinct sequence of amino acid segments which comprises reacting, in an aqueous medium, a pure precursor containing a first amino acid segment of the peptide chain to be prepared having a free terminal carboxyl group or a free terminal amino group, with a second amino acid segment containing a free Nα-amino group and a blocked carboxyl group susceptible to enzymatic hydrolysis when the precursor has a free terminal carboxyl group or a free carboxyl group and a blocked Nα-amino group susceptible to enzymatic hydrolysis when the precursor has a free terminal amino group, deblocking the product peptide enzymatically, and then repeating the process of reaction and enzymatic deblocking until the desired peptide chain is prepared.

4,315,075

## METHODS OF REDUCING SMOKE EVOLUTION FROM BURNING NEOPRENE FOAM AND NEOPRENE FOAM PRODUCTS PRODUCED THEREBY

Esther C. Gardner, Westmoreland, Pa., assignor to Toyad Corporation, Latrobe, Pa.

Filed Oct. 15, 1980, Ser. No. 197,110
Int. Cl.³ C08J 9/30
U.S. Cl. 521—71 5 Claims

1. A low smoke neoprene latex foam composition having physical properties suitable for cushioning, consisting essentially of neoprene latex incorporating at least 200 parts of hydrated alumina per 100 parts of dry neoprene latex, said hydrated alumina being made up of at least 66% of large particle size hydrated alumina in the size range of 40 microns and larger and the balance hydrated alumina in the size range below 40 microns.

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4,315,076

## POLYIMIDES

John Gagliani, and Raymond Lee, both of San Diego, Calif., assignors to International Harvester Company, Chicago, Ill.

Continuation-in-part of Ser. No. 186,668, Sep. 12, 1980, abandoned. This application Apr. 14, 1981, Ser. No. 254,137
Int. Cl.³ C08J 9/00; C08G 18/16
U.S. Cl. 521—77 11 Claims

1. A method of preparing a foamable terpolyimide precursor which includes the steps of: dissolving a benzophenonetetracarboxylic acid or anhydride in an excess of an alkyl alcohol esterification agent to form a solution of an ester of the acid and adding to and dissolving in said solution in amounts such that the imide forming functionalities are substantially equimolar a heterocyclic diamine, an aromatic diamine, and an aliphatic diamine, there being from 0.05 to 0.5 mole of aliphatic diamine and from 0.05 to 0.9 mole of heterocyclic diamine per mole of 3,3',4,4'-benzophenonetetracarboxylic acid ester and the order of addition of the diamines to the solution being such that neither the aromatic nor the heterocyclic diamines are added after the aliphatic diamine.

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4,315,077

## POLYIMIDES

John Gagliani, and Raymond Lee, both of San Diego, Calif., assignors to International Harvester Company, Chicago, Ill.

Division of Ser. No. 254,137, Apr. 14, 1981, which is a continuation-in-part of Ser. No. 186,668, Sep. 12, 1980, abandoned. This application May 27, 1981, Ser. No. 267,460
Int. Cl.³ C08J 9/00; C08G 18/16
U.S. Cl. 521—77 19 Claims

1. A method of preparing a terpolyimide foam which includes the steps of: dissolving 3,3',4,4'-benzophenonetetracarboxylic acid or an anhydride thereof in an excess of an alkyl alcohol or mixture of such esters to form a solution of an ester of the acid; adding to and dissolving in said solution in amounts such that the imide forming functionalities are substantially equimolar a heterocyclic diamine, an aromatic diamine, and an aliphatic diamine, there being from 0.05 to 0.5 mole of aliphatic diamine and from 0.05 to 0.9 mole of heterocyclic diamine per mole of 3,3',4,4'-benzophenonetetracarboxylic acid ester; and converting the material existing after said dissolution of said diamines to a polymeric foam.

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4,315,078

## FLAME RETARDANT FLEXIBLE POLYURETHANE FOAM CONTAINING FINELY DIVIDED INORGANIC SALT WHEREIN A MOLD OF SAID SALT CONTAINS AT LEAST FIVE MOLES OF WATER

Carlos J. Anorga, San Pedro, Calif., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 23, 1980, Ser. No. 171,449
Int. Cl.³ C08G 18/14
U.S. Cl. 521—103 13 Claims

1. In a flame retardant flexible polyurethane foam prepared under foam producing conditions from an aromatic polyisocyanate, a polyether polyol having an equivalent weight from about 500 to about 2500 and a functionality from about 2.0 to about 4.0, antimony oxide and a polyhalogenated aromatic compound wherein the improvement comprises employing in the foam forming reaction mixture the following ingredients in parts by weight based on 100 parts of said polyether polyol:

(a) from about 4 to about 30 parts of antimony oxide;
(b) from about 4 to about 40 parts of a polyhalogenated aromatic compound; and
(c) from about 30 to about 60 parts of a finely divided hydrated inorganic salt wherein a mole of said salt contains at least 5 moles of water of hydration; and

employing a ratio of isocyanate equivalents to total equivalents of active hydrogen containing materials in the foam forming reaction mixture within a range of from about 0.90:1.0 to about 1.0:1.0.

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4,315,079

## PROCESS OF MAKING AN ISOCYANURATE FOAM

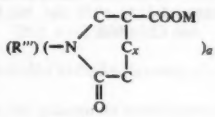
Heinz Schulze; Robert L. Zimmerman, and Harold G. Waddill, all of Austin, Tex., assignors to Texaco Development Corporation, White Plains, N.Y.

Division of Ser. No. 847,642, Nov. 1, 1977, which is a continuation-in-part of Ser. No. 689,409, May 24, 1976, abandoned. This application Apr. 1, 1981, Ser. No. 249,800
Int. Cl.³ C08J 9/00
U.S. Cl. 521—115 8 Claims

1. The method of preparing a cured isocyanurate foam which comprises

reacting an isocyanate with a polyol having at least two active Zerewitinoff-active hydrogen atoms in the presence of a blowing agent thereby forming a polyisocyanurate form; and

conducting said reaction in the presence of 0.5–10 parts (per 100 parts of total formulation) of a curing agent



wherein x is an integer 0–2; a is an integer at least 2; M is alkali metal or quaternary ammonium; R''' is a polyoxyalkylene chain, of a molecular weight of about 200–2100, having terminal carbon atoms to which the nitrogen atoms are bonded.

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4,315,080

## POLYIMIDES

John Gagliani, and Raymond Lee, both of San Diego, Calif., assignors to International Harvester Company, Chicago, Ill.

Division of Ser. No. 254,137, Apr. 14, 1981, which is a continuation-in-part of Ser. No. 186,688, Sep. 12, 1980, abandoned. This application May 27, 1981, Ser. No. 267,459
Int. Cl.³ C08J 9/00; C08G 18/16
U.S. Cl. 521—189 16 Claims

1. A terpolyimide foam derived from a precursor comprising an essentially stoichiometric mixture of an alkyl ester of 3,3',4,4'-benzophenonetetracarboxylic acid or a mixture of such esters and at least three diamines, one of said diamines being heterocyclic, a second of said diamines being aromatic, a third of said diamines being aliphatic, and there being from 0.05 to 0.5 mole of aliphatic diamine and from 0.05 to 0.9 mole of heterocyclic diamine per mole of benzophenonetetracarboxylic acid ester(s).

4,315,081

## ANTISTATIC RESIN COMPOSITION

Akio Kobayashi, and Takayuki Katto, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 18, 1981, Ser. No. 235,730
Claims priority, application Japan, Feb. 22, 1980, 55/21172
Int. Cl.[3] C08K *5/04, 5/09, 5/41;* C08L *51/04*
U.S. Cl. 525—2 9 Claims

1. An antistatic resin composition comprising:
(1) 100 parts of a base resin; and
(2) 0.1 to 5 parts of an anionic surfactant,
said base resin comprising
(A) 7 to 100 parts of a graft copolymer obtained by graft-polymerizing 5 to 95% of at least one ethylenically unsaturated monomer onto 5 to 95% of a rubber trunk polymer which in turn is a copolymer of
(i) 30 to 90% of an elasticity-imparting monomer selected from the group consisting of conjugated dienes, alkyl acrylates and mixtures thereof,
(ii) 10 to 70% of a polyalkylene oxide monomer which is a monomer comprising 4 to 500 alkylene oxide groups together with an ethylenic unsaturation, and
(iii) 0 to 50% of at least one ethylenically unsaturated monomer copolymerizable with the elasticity-imparting monomer, and
(B) 0 to 93 parts of a thermoplastic resin compatible with said graft copolymer (A),
said rubber trunk polymer being 5 to 80% of the total of the graft copolymer (A) and the thermoplastic resin (B),
all quantities expressed in parts and percentages being by weight.

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4,315,082

## PHOSPHORUS COMPOUNDS

Harry H. Beacham, Langhorne, Pa., and Robert D. Norris, Cranbury, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 866,493, Jan. 3, 1978, abandoned. This application Jul. 26, 1979, Ser. No. 61,138
Int. Cl.[3] C08K *5/14, 5/02*
U.S. Cl. 525—20 11 Claims

1. A mixture of a peroxide-reactive polymer and a peroxide composition,
said peroxide composition comprising an organic phosphorus compound having a hydroperoxide group attached directly to a carbon atom of said organic phosphorus compound, there being at least one such hydroperoxide group per 500 phosphorus atoms in said composition.

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4,315,083

## PROCESS FOR THE CONTINUOUS MASS POLYMERIZATION OF POLYBLENDS

Raymond D. Burk, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed May 15, 1980, Ser. No. 150,274
Int. Cl.[3] C08F *279/02, 279/04;* C08L *51/04*
U.S. Cl. 525—53 22 Claims

1. In an improved method for the mass polymerizing of a solution comprising an alkenyl aromatic monomer having a polybutadiene rubber dissolved therein, the steps comprising:
A. continuously charging said monomer solution having 1 to 10% by weight of a polybutadiene rubber dissolved therein to a first reaction zone operating at steady state polymerization of about 20 to 45% of said monomers to a first partially polymerized mixture, said mixture being said monomer having polymers of said monomer and polybutadiene rubber particles grafted with said monomer dispersed in said monomers,
B. continuously charging said partially polymerized mixture to a second reaction zone operating at a final polymerization of about 50 to 85% of said monomer forming a second partially polymerized mixture,
C. continuously separating the residual monomer from said second mixture providing a matrix phase polymer of said monomer having said grafted rubber particles dispersed therein, said improvement comprising: charging a monomer-polybutadiene solution in step (A) having in addition about 1 to 10% by weight of a diene block copolymer and about 1 to 20% by weight of a polymer of said monomer dissolved in said solution followed by carrying out steps (B) and (C) to form a polyblend of said matrix phase polymer having rubber particles grafted with said monomers dispersed therein, said rubber particles containing rubbers consisting of polybutadiene and diene block copolymer, said rubber particles being a gel fraction in said polyblend containing grafted and occluded polymers of said monomers in amount of about 0.5 to 5 parts per part of total rubber.

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4,315,084

## POLYPHENYLENE ETHER MOLDING COMPOSITIONS THAT INCLUDE AN ALKENYL AROMATIC RESIN AND EPDM RUBBER

Glenn D. Cooper, Delmar; Gim F. Lee, Jr., Albany, and Rainey A. Shufelt, Coeymans, all of N.Y., assignors to General Electric Company, Selkirk, N.Y.

Filed Jan. 14, 1980, Ser. No. 111,983
Int. Cl.[3] C08F *8/00;* C08L *61/04*
U.S. Cl. 525—69 16 Claims

1. A thermoplastic molding composition which comprises:
(a) a polyphenylene ether resin;
(b) an alkenyl aromatic resin; and
(c) a rubbery interpolymer of a mixture of mono-olefins and a polyene.

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4,315,085

## CORE-SHELL COMPOSITE POLYMERS HAVING HIGH AMOUNTS OF CARBOXYLIC ACID UNITS IN THE SHELL

Yehuda Ozari, Louisville, Ky., and Eugene S. Barabas, Watchung, N.J., assignors to GAF Corporation, New York, N.Y.

Filed Jul. 25, 1980, Ser. No. 172,924
Int. Cl.[3] C08F *265/06, 263/04*
U.S. Cl. 525—301 12 Claims

1. A core-shell composite polymer having a soft polymer core and a two layered shell having up to about 40 mole percent of methacrylic acid units therein, said core-shell composite polymer being produced by a process comprising the steps of:
(a) providing, as the core polymer, an emulsion comprising discrete particles of a soft polymer of butadiene or copolymer of ethylene and vinyl acetate in an aqueous vehicle,
(b) adding to the emulsion, as a monomer to form an inner layer of the shell, methylmethacrylate in an amount sufficient to form, upon polymerization, a substantially complete enclosure around the particles of the core polymer,
(c) reacting the emulsion under conditions effective to polymerize the methylmethacrylate to form discrete soft polymer core particles which are completely encased by an integral enclosure of poly(methylmethacrylate), but are free of methylmethacrylate at least in the center thereof,
(d) further adding to the emulsion, as monomers to form an outer layer of the shell, a mixture of methylmethacrylate and methacrylic acid in molar ratio of from 1:3 to 3:1, in an amount sufficient to form, upon polymerization, a substantially complete enclosure around the encased particles of the core polymer, and
(e) reacting the emulsion, under conditions effective to copolymerize the methylmethacrylate and methacrylate acid, thereby forming around the encased polymer particles produced in step (c) an integral outer shell layer of a copolymer of methylmethacrylte and methacrylate acid.

4,315,086

## RESIN COMPOSITIONS

Katsuji Ueno, Hirakata, and Takashi Maruyama, Toyonaka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 16, 1980, Ser. No. 169,368

Claims priority, application Japan, Aug. 8, 1979, 54-101682; Sep. 26, 1979, 54-124574

Int. Cl.³ C08F *283/08;* C08L *71/04*

U.S. Cl. 525—391 12 Claims

1. A resin composition comprising a resin composition comprising 5 to 95% by weight of a polyphenylene oxide and 95 to 5% by weight of a polyamide and 0.01 to 30 parts by weight of a member selected from the group consisting of (A) liquid diene polymers, (B) epoxy compounds and (C) compounds having in the molecule both of (a) an ethylenic carbon-carbon double bond or a carbon-carbon triple bond and (b) a carboxylic acid, acid anhydride, acid amide, imido, carboxylic acid ester, amino or hydroxyl group per 100 parts by weight of the total of polyphenylene oxide and polyamide.

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4,315,087

## QUATERNARY POLYAMINOAMIDES

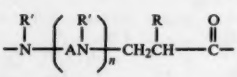
Derek Redmore, Ballwin, and Benjamin T. Outlaw, St. Louis, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Apr. 28, 1975, Ser. No. 571,927

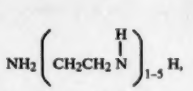
Int. Cl.³ C08G *73/02*

U.S. Cl. 525—421 9 Claims

1. Quaternaries of polymers of the general unit formula



where R is hydrogen or methyl, R' is hydrogen, A is a $-CH_2CH_2-$ moiety of a hydrocarbon polyamine which links amino groups and n is an integer; and cross-linked derivatives thereof, where the polyamine is of the general formula



wherein the quaternizing agent is selected from the group consisting of benzyl chloride, ethylene dichloride and p-dodecyl benzyl chloride.

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4,315,088

## PROCESS FOR PRODUCING α-OLEFIN POLYMER

Sadao Kitagawa; Isao Okada, and Teruo Saito, all of Ami, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Dec. 11, 1979, Ser. No. 102,467

Claims priority, application Japan, Dec. 15, 1978, 53/154705

Int. Cl.³ C08F *4/02, 10/04*

U.S. Cl. 526—125 15 Claims

1. A process for producing an α-olefin polymer which comprises homopolymerizing an α-olefin selected from the group consisting of propylene, butene-1, and 4-methylpentene-1, or copolymerizing two or more of said α-olefins or one or more of said α-olefins and ethylene or an α-olefin containing 4 to 8 carbon atoms in the presence of a catalyst consisting essentially of:

(I) a solid catalyst component prepared by contacting with each other, (A) a magnesium dihalide of the formula $MgX_2$ where x is a halogen atom, (B) an aromatic carboxylic acid ester, (C) titanium tetrachloride, and (D) a siloxyaluminum compound selected from the group consisting of trimethylsiloxyaluminum dichloride, triethylsiloxyaluminum dichloride, triphenyl-siloxyaluminum dichloride, trichlorosiloxyaluminum dichloride, a reaction product of dimethylpolysiloxane and aluminum chloride, a reaction product of methylphenylpolysiloxane and aluminum chloride, or a reaction product of methylhydrogenpolysiloxane and aluminum chloride; and

(II) organometallic compound of a metal of Groups I, II or III in the Periodic Table, wherein ingredient B is used in an amount of about 0.01 to 10 mols, ingredient C in an amount of about 0.001 to 1,000 mols, and ingredient D in an amount of about 0.001 to 1 mol, per mol of ingredient A; and wherein said ingredients A, B and D are pulverized together, contacted with ingredient C in a slurry state, and washed.

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4,315,089

## POLYMERS CONTAINING AROMATIC ALDEHYDE GROUPS

Herbert Naarmann, Wattenheim; Guenter Wulff, Alfter-Impekoven, both of Fed. Rep. of Germany, and Ahmed Akelah, Kafer el Zyat, Egypt, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 13, 1979, Ser. No. 93,931

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1978, 2848967

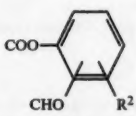
Int. Cl.³ C08F *16/34*

U.S. Cl. 526—89 18 Claims

1. A polymer which has a K value of from 20 to 140 and which contains structural units of the general formula (I)

(I)

where $R^1$ is H or $CH_3$ and A is

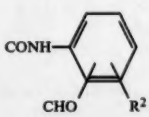


where $R^2$ is H, OH, O-alkyl, alkoxyalkyl or O—$Si(CH_3)_3$.

10. A polymer which has a K value of from 20 to 140 and which contains structural units of the general formula (I)

(I)

where $R^1$ is H or $CH_3$ and A is



where $R^2$ is H, OH, O-alkyl, alkoxyalkyl or O—$Si(CH_3)_3$.

4,315,090

## TITANIUM TRICHLORIDE CATALYTIC COMPONENT AND METHOD FOR HOMO- OR CO-POLYMERIZATION OF α-OLEFIN

Yoshikazu Takahashi, Hikari; Yoichi Sunada, and Masaru Takitani, both of Shinnanyo, all of Japan, assignors to Toyo Stauffer Chemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 49,987, Jun. 19, 1979, Pat. No. 4,251,388.
This application Oct. 12, 1979, Ser. No. 84,119
Claims priority, application Japan, Jun. 23, 1978, 53/76168
Int. Cl.³ C08F *4/64, 10/06*
U.S. Cl. 526—119 16 Claims

1. A method for homo- or copolymerizing an alphaolefin characterized in that the polymerization is conducted in the presence of a catalyst consisting of: (a) a first organoaluminum compound; and (b) a spherical titanium trichloride catalytic component prepared by: (i) mixing a saturated alphatic hydrocarbon and/or an alicyclic hydrocarbon and 20 to 70% by volume of an aromatic hydrocarbon halide to form a mixed solvent; (ii) forming a system by dissolving titanium tetrachloride, an ether and a second organo-aluminum compound which can be the same as the first organo-aluminum compound in said mixed solvent, said second organo-aluminum compound, said titanium tetrachloride and said ether being added to said mixed solvent at a solvent temperature not exceeding 55° C.; (iii) raising the temperature of said system to between 45° and 150° C. over a period of between 10 minutes and 24 hours; and (iv) adding an ether and/or titanium tetrachloride to said system while raising its temperature to cause said spherical titanium trichloride catalytic component, which has a substantially uniform particle diameter and an average particle diameter which is adjustable between 10 and 1000μ, to separate from said mixed solvent.

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4,315,091

## COATINGS FOR THERMOPLASTICS

Helmut Steinberger; Manfred Schönfelder, both of Leverkusen; Hans-Heinrich Moretto, and Christian Wegner, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 7, 1980, Ser. No. 137,699
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1979, 2914427
Int. Cl.³ C08G *77/04*
U.S. Cl. 528—28 9 Claims

1. A coating composition consisting essentially of about

(A) 10–40% by weight of a partially hydrolyzed siloxane compound which is obtained by hydrolyzing in water at about 50°–80° C. over a period of about 1–12 hours at least one of (a), (b), (c), and (d), wherein

(a) is a hydrocarbon-trialkoxysilane of the formula $R'Si(OR'')_3$ wherein

R' is an alkyl group with 1 to 4 carbon atoms or a phenyl or vinyl group, and

R'' is an alkyl group with 1 to 4 carbon atoms

(b) is a co-condensation product of (a) and about 1 to 40% by weight of phenyl- or vinyl-trialkoxysilane, the alkoxy group containing 1 to 4 carbon atoms,

(c) is a co-condensation product of 1 mol of (a) and 0.05 to 1 mol of a tetraalkoxysilane, in which the alkyl and alkoxy groups contain 1 to 4 carbon atoms,

(B) 0 to 40% by weight of an aqueous dispersion of colloidal silicon dioxide,

(C) 0 to 5% by weight of an etherified methylolmelamine,

(D) 0.05 to 15% by weight of a blocked polyisocyanate,

(E) 0.5 to 30% by weight of acetic acid, and

(F) an inert organic solvent as the remainder.

4,315,092

## POLYACETAL CARBOXYLATES

Marvin M. Crutchfield, Creve Coeur; Victor D. Papanu, Maryland Heights, both of Md., and Craig B. Warren, Rumson, N.J., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 826,424, Aug. 22, 1977, abandoned. This application Nov. 20, 1978, Ser. No. 974,667
Int. Cl.³ C08G *6/00*
U.S. Cl. 528—230 8 Claims

1. A polyacetal carboxylate having the following empirical formula:

wherein M is selected from the group consisting of alkali metal, ammonium, tetra-alkyl ammonium groups and alkanol ammonium groups having from 1 to about 4 carbon atoms in the alkyl chain; and n averages at least 4.

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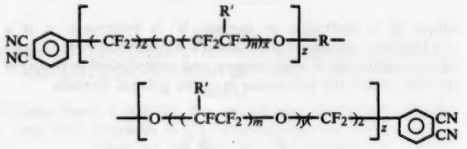
4,315,093

## FLUORINATED POLYPHTHALOCYANINES

Teddy M. Keller, Alexandria, Va., and James R. Griffith, Riverdale Heights, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 26,863, Apr. 4, 1979, Pat. No. 4,209,458.
This application Nov. 9, 1979, Ser. No. 92,909
Int. Cl.³ C08G *73/06*
U.S. Cl. 528—362 11 Claims

1. A polyphthalocyanine resin prepared from a fluorinated phthalonitrile of the general formula:



wherein r' is F or $CF_3$, R is $(CF_2)_p$, m is 1 or 2, n is 1 or 2, p is an integer from 3 to 30, x is 0, 1, 2 or 3, y is 0, 1, 2, or 3 and z is 0 or 1.

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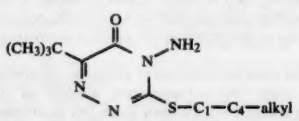
4,315,094

## PREPARATION OF 4-AMINO-6-TERT-BUTYL-3-ALKYL-THIO-1,2,4-TRIAZIN-5(4H)-ONE

Gerhard Bonse, Cologne; Heinz U. Blank, Odenthal, and Hans Krätzer, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 19, 1981, Ser. No. 235,495
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1980, 3008921
Int. Cl.³ C07D *253/06*
U.S. Cl. 544—182 24 Claims

1. In the preparation of 4-amino-6-tert.-butyl-3-alkylthio-1,2,4-triazin-5(4H)-one of the formula



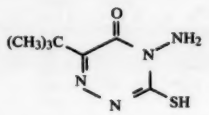
wherein (1) pivaloyl cyanide of the formula

$(CH_3)_3C—CO—CN$

is reacted to form a derivative of pyruvic acid, (2) the pyruvic acid derivative is condensed with thiocarbohydrazide of the formula

$NH_2—NH—CS—NH—NH_2$

to form 4-amino-6-tert.-butyl-3-mercapto-1,2,4-triazin-5(4H)-one of the formula



and (3) this is alkylated, the improvement which comprises effecting step (1) by reaction with a carboxylic acid anhydride of the formula

$R—CO—O—CO—R$

in which R is an optionally substituted aliphatic radical with up to 8 carbon atoms or an optionally substituted phenyl radical, in the presence of a strong acid at a temperature between about $-50°$ and $+150°$ C., and then adding water to the reaction mixture, thereby to form trimethylpyruvic acid N-acylamide of the formula

$(CH_3)_3C—CO—CO—NH—CO—R.$

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**4,315,095**

## α-HALOMETHYL DERIVATIVES OF AMINO ACIDS

**Philippe Bey, Strasbourg, and Michel Jung, Illkirch Graffestaden, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France**

**Filed Jul. 28, 1977, Ser. No. 819,975**

**Int. Cl.**[3] **A61K** *31/415;* **C07D** *233/64*

**U.S. Cl. 548—344** **1 Claim**

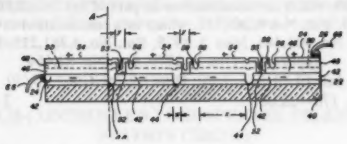
1. 2-Amino-2-difluoromethyl-3-(5-imidazoyl)propionic acid or a pharmaceutically acceptable salt thereof.

4,315,096

## INTEGRATED ARRAY OF PHOTOVOLTAIC CELLS HAVING MINIMIZED SHORTING LOSSES

Yuan-Sheng Tyan, Webster, and Evelio A. Perez-Albuerne, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 25, 1980, Ser. No. 172,117
Int. Cl.[3] H01L *31/04, 31/18*
U.S. Cl. 136—244 11 Claims



1. In an array comprising an insulative support and generally elongated photovoltaic cells connected in series on the support, the majority of said cells together comprising:

(1) a plurality of spaced-apart segments of a first electrode material disposed on said support;

(2) a plurality of semiconductor segments, each of said semiconductor segments

(a) being disposed in contact with and overlying all but an edge portion of a segment of said electrode material, and in contact with a portion of the support,

(b) comprising a layer of semiconductor material having a resistance high enough to prevent a short between adjacent electrode segments, and

(c) having edge surfaces spaced from the edge surfaces of adjacent semiconductor segments; and

(3) a plurality of spaced-apart segments of a second electrode material, each of said second electrode segments overlying and contacting at least a portion of a semiconductor segment, and contacting said edge portion of said first electrode segment of an adjacent cell,

said electrode segments and said semiconductor segments being effective to provide a photovoltaic effect therebetween;

the improvement wherein each of said second electrode segments contacts two adjacent semiconductor segments, and adjacent second electrode segments are separated by a groove that extends down to at least said high-resistance semiconductor layer,

whereby shorting between said second electrode segments through said semiconductor segments is substantially prevented.

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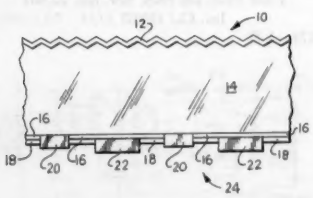
4,315,097

## BACK CONTACTED MIS PHOTOVOLTAIC CELL

Allen L. Solomon, Fullerton, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Oct. 27, 1980, Ser. No. 200,943
Int. Cl.[3] H01L *31/06*
U.S. Cl. 136—255 23 Claims



1. A photovoltaic cell comprising a semiconductor substrate having substantially parallel opposite surfaces, a first surface thereof being substantially free of any shadowing effects and adapted to receive incident radiation, and a second opposite surface thereof having at least one ohmic contact and at least one metal-insulator-semiconductor (MIS) contact.

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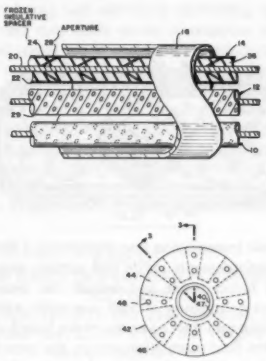
4,315,098

## INSULATIVE SPACER FOR A LOW TEMPERATURE COAXIAL CABLE AND COAXIAL CABLE INCLUDING THE SAME

John J. Dougherty, San Jose; Mario Rabinowitz, Menlo Park, both of Calif., and George Bahder, Edison, N.J., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jul. 25, 1979, Ser. No. 60,394
Int. Cl.[3] H01B *12/00, 3/16, 3/56, 9/04*
U.S. Cl. 174—15 S 8 Claims




1. An insulative spacer for use in a coaxial cable having an inner conductor, an outer conductor, a dielectric material in the space between said inner and outer conductors, said dielectric material being a solid at cable operating temperature and a non-solid at ambient temperature, and means for maintaining the temperature of said dielectric material below the solidification point, said insulative spacer functioning to maintain the inner conductor in coaxial alignment with the outer conductor,

said insulative spacer comprising first insulative material having a centrally disposed opening and an outer peripheral configuration, said first insulative material being a solid at cable operating temperature and a non-solid at ambient temperature, and an insert in said first insulative material, said insert comprising second insulative material which is a solid at cable operating temperature and a non-solid at ambient temperature and which has a solidification point higher than said first insulative material whereby when in use at least approximate coaxial spacing may be maintained between the inner conductor and the outer conductor of a coaxial cable in the event said first insulative material is not maintained as a solid.

5. A low temperature coaxial cable comprising an inner conductor, an outer conductor, a dielectric material in the space between said inner and outer conductors, said dielectric material being a solid at cable operating temperature and a non-solid at ambient temperature, means for maintaining the temperature of said dielectric material below the solidification point, and an insulative spacer for maintaining said inner conductor in coaxial alignment with said outer conductor, said spacer including a centrally disposed opening receiving said inner conductor and an outer peripheral configuration mating with the inner surface of said outer conductor, said spacer comprising a first insulative material which is identical to said dielectric material and an insert in said first insulative material, said insert comprising a second insulative material which is a solid at cable operating temperature and a non-solid at ambient temperature and which has a solidification point higher than said first insulative material whereby at least approximate coaxial spacing may be maintained between said inner conduc-

tor and said outer conductor in the event said first insulative material is not maintained as a solid.

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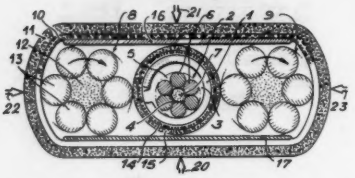
**4,315,099**
**FLEXIBLE TRANSMISSION LINE FOR A FLUID AND FOR ELECTRIC SIGNALS**

**Claude Gerardot, Sartrouville, and Georges Romero, Massy, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France**

**Filed Jan. 2, 1980, Ser. No. 109,064**
**Claims priority, application France, Jan. 12, 1979, 79 00750**
**Int. Cl.³ F16L *11/12*; H01B *7/18***
**U.S. Cl. 174—47** **15 Claims**



1. A flexible transmission line comprising a fluid circulation duct and reinforcements inside and outside said duct against compressive forces inside and outside the duct, the internal reinforcement comprising at least one cable within said duct, whereby within said duct over the entire length of the line the cable provides fluid circulation spaces, the external reinforcements being coaxial to the duct, the internal cable being a flexible cable constituted by a central core surrounded by strands, the duct being an undulating tube, whose longitudinal section is in the form of a hollow screw with helical internal pitch and helical external pitch, and the external reinforcement being a structure with slings tangential to the duct and surrounded by a sleeve for maintaining contact between the duct and the slings.

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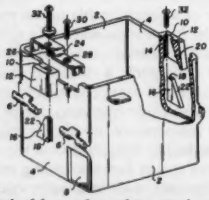
**4,315,100**
**ELECTRICAL BOX**

**Joseph Haslbeck, West Vancouver, and Allan Liggins, Coquitlam, both of Canada, assignors to Highland Manufacturing Company, Ltd., Burnaby, Canada**

**Filed Dec. 6, 1979, Ser. No. 100,934**
**Int. Cl.³ H02G *3/08***
**U.S. Cl. 174—51** **7 Claims**



1. An electrical box adapted to receive an electrical fitting; openings formed in the box to align with openings formed in the fitting;
a ground strap;
threaded portions within each opening and adapted to move apart upon insertion of a screw but to grip the screw when the screw is rotated;
one threaded portion being a threaded projection on the ground strap, the threaded projection on the ground strap extending into one of said openings in the box;
a second threaded portion in said one of said openings being formed on a resiliently mounted member.

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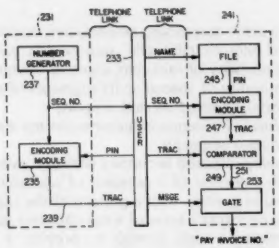
**4,315,101**
**METHOD AND APPARATUS FOR SECURING DATA TRANSMISSIONS**

**Martin M. Atalla, Atherton, Calif., assignor to Atalla Technovations, San Jose, Calif.**

**Continuation-in-part of Ser. No. 9,532, Feb. 5, 1979, Pat. No. 4,283,599, which is a continuation-in-part of Ser. No. 3,898, Jan. 16, 1979, Pat. No. 4,268,715, which is a continuation-in-part of Ser. No. 902,444, May 3, 1978, Pat. No. 4,281,215. This application Oct. 9, 1979, Ser. No. 82,464**
**Int. Cl.³ H04L *9/00*; H04Q *9/00*; G06F *15/30***
**U.S. Cl. 178—22.08** **2 Claims**




2. The method of completing a secured transaction at a remote location using unsecured communication channels and identification information about a user stored at the remote location, the method comprising:
generating a coding signal with respect to the transaction;
producing a first coded output signal in response to a logical combination of the generated coding signal and the identification information supplied by the user;
communicating to the user the first coded output signal and the coding signal used to produce said first coded output signal;
communicating the coding signal to the remote location under control of the user;
producing a second coded output signal in accordance with said logical combination of the stored identification information about the user and the coding signal supplied by the user;
communicating the first coded output signal to the remote location under control of the user; and
comparing said first and second coded output signals to provide an indication of authorization to complete the transaction with respect to said user.

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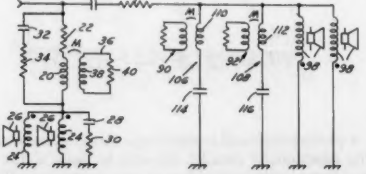
**4,315,102**
**SPEAKER CROSS-OVER NETWORKS**

**Steven J. Eberbach, 724 S. Division, Ann Arbor, Mich. 48104**

**Filed Mar. 21, 1979, Ser. No. 22,601**
**Int. Cl.³ H04R *3/14***
**U.S. Cl. 179—1 D** **33 Claims**



1. In an electric loudspeaker circuit comprising at least one

electroacoustic driver, an acoustic frequency filter connected to said driver, said filter including a first inductance and a resistance in series with each other and in series with said driver and a capacitance in parallel with said driver,

the improvement characterized by,

a second circuit comprising at least one inductance,

said inductance in the second circuit positioned for magnetic coupling to the first inductance,

said first inductance and second circuit being selected and adjusted for substantially linear phase response of the driver and filter combination within and beyond the pass band.

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**4,315,103**

## SPEECH-CONTROLLED LOUDSPEAKER TELEPHONE STATION CIRCUIT

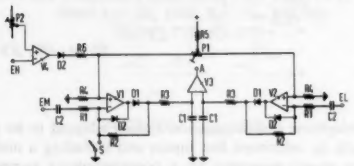
**Klaus Walla, Gauting, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Sep. 7, 1979, Ser. No. 73,569**

**Claims priority, application Fed. Rep. of Germany, Sep. 28, 1978, 2842369**

**Int. Cl.³ H04M *9/08***

**U.S. Cl. 179—1 VC** **10 Claims**



1. A circuit arrangement for a speech-controlled loudspeaker telephone station having a microphone and a loudspeaker, comprising in combination; a first operational amplifier for receiving a signal from said microphone, and a second operational amplifier for receiving a signal proportional to the signal supplied to said loudspeaker, both of said operational amplifiers having level-dependent negative feedback including separate feedback paths including diodes for positive-going and negative-going half-cycles, and a comparator connected to one of said feedback paths to receive the rectified output voltages of said first and second operational amplifiers and for producing a signal indicative of the direction of speech transmission.

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**4,315,104**

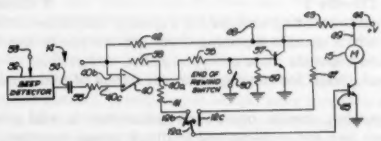
## AUTOMATICALLY RESET CONTROL MECHANISM FOR REMOTE PLAYOUT TELEPHONE ANSWERING DEVICE

**Sava Jacobson, 8130 Orion St., Van Nuys, Calif. 91406**

**Filed Jan. 14, 1980, Ser. No. 111,589**

**Int. Cl.³ H04M *1/64***

**U.S. Cl. 179—6.07** **6 Claims**



1. In a telephone answering device of the type wherein during automatic answering operation an incoming message is recorded on a tape driven by a tape drive element, and wherein recorded incoming messages are played out over the telephone line under remote control in response to detection of a coded signal, the improvement comprising:

a cam mechanism including a cam and a cam drive motor for driving said cam, said tape drive element being positionable by said cam alternatively to a forward position in which said tape drive element drives said imcoming message tape in a forward direction and to a rewind position in which said tape drive element rewinds said tape, said cam mechanism normally operating in response to receipt of said coded signal,

switch contact means for sensing the orientation of said cam, and

a cam control circuit conditioned for operation by said switch contact means, said cam control circuit being operative during said automatic answering operation to energize said cam drive motor in response to receipt of said coded signal while said switch contact means senses that said cam is in a first orientation in which said tape drive element is in said forward position, said cam control circuit being operative when power first is applied to said device, if said switch contact means then senses that said cam is not in said first orientation, to energize said cam drive motor so as to drive said cam to said first orientation, said cam mechanism then being in readiness for normal operation in response to receipt of said coded signal.

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**4,315,105**

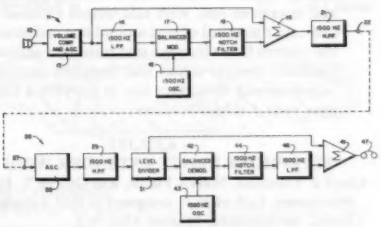
## NARROW BAND TRANSMISSION SYSTEM AND METHOD

**Herman P. Miller, III, P.O. Box 2163, Stockton, Calif. 95201**

**Filed Nov. 23, 1976, Ser. No. 744,305**

**Int. Cl.³ H04B *1/66***

**U.S. Cl. 179—15.55 R** **15 Claims**



1. In a method for transmitting signals having high and low frequency components which are displaced in time in such manner that only one of the components is present at a significant energy level at any instant of time, the steps of: continuously translating a first one of the components to the frequency range of the second component with no switching of the first component, combining the translated component with the first and second components with no switching of any of said components, and removing the first component from the combined signal to provide an output signal consisting substantially of the second component and the translated first component.

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**4,315,106**

## APPARATUS FOR REGULATING CURRENT SUPPLIED TO A TELEPHONE LINE SIGNAL OF THE TYPE EMPLOYED IN DIGITAL TELEPHONE SYSTEMS

**Ramon C. W. Chea, Jr., Monroe, Conn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed Nov. 28, 1979, Ser. No. 98,104**

**Int. Cl.³ H04M *19/00***

**U.S. Cl. 179—16 F** **11 Claims**

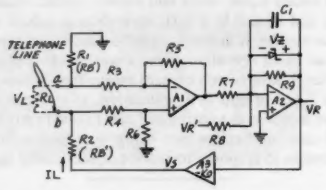
1. A line circuit for supplying a regulated loop current to a two-wire telephone subscriber line, said telephone line connected between first and second terminals at a subscriber set,

said telephone line having an impedance which varies according to the length of said line, comprising:

first and second line feed resistances of substantially the same magnitude, said first resistance coupled between one of said wires and a point of reference potential, with one terminal of said second resistance coupled to said other of said wires;

differential amplifier means having first and second input terminals, with said first input terminal coupled to said wire associated with said first resistance and said second input terminal coupled to said other wire, said amplifier providing an output voltage manifesting a predetermined first control signal;

DC reference source for providing a reference signal which can be supplied to a telephone line;




summing means having a first and a second input with said first input responsive to said first control signal and said second input responsive to said reference signal to provide an output feedback control signal proportional to the sum of said reference signal and said control signal; and

active circuit means having an input responsive to said feedback control signal to provide at an output terminal a voltage signal indicative of a line current to be supplied to said telephone line, with said output terminal coupled to said other terminal of said second line resistance, whereby the current flows through said resistance according to said feedback control signal and therefore according to the length of said subscriber line to provide a range of voltages to said subscriber line.

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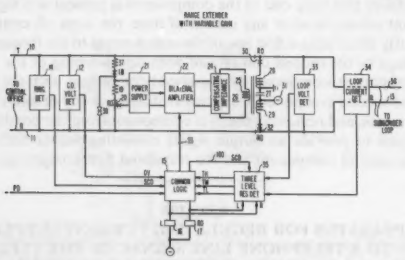
**4,315,107**

## TELEPHONE RANGE EXTENDER WITH GAIN

**Albert J. Ciesielka, Morris Plains, and George T. Hawley, New Providence, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Oct. 15, 1979, Ser. No. 84,917**
**Int. Cl.³ H04M *1/76***
**U.S. Cl. 179—16 F** **3 Claims**




1. A telephone subscriber loop range extender including circuits for enhancing telephone service over subscriber loops longer than average in length, said range extender characterized by

first means for detecting the length of a connected subscriber loop, and

means responsive to said first detecting means for disconnecting said enhancing circuits from a connected subscriber loop having a length shorter than a predetermined length,

said enhancing circuits including a voice frequency bidirectional amplifier and supervisory signal detecting means.

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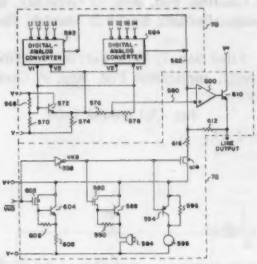
**4,315,108**

## INTEGRATED CIRCUIT CHIP TELEPHONE COMMUNICATION SYSTEM

**Gordon B. Hoffman, Dallas, and Michael J. Callahan, Jr., Garland, both of Tex., assignors to Mostek Corporation, Carrollton, Tex.**

**Continuation of Ser. No. 831,736, Sep. 9, 1977, abandoned, which is a division of Ser. No. 617,955, Sep. 29, 1975, Pat. No. 4,061,886. This application Jan. 10, 1979, Ser. No. 2,424**
**Int. Cl.³ H04M *1/50***
**U.S. Cl. 179—84 VF** **18 Claims**




1. A telephone communication system adapted to be powered solely by telephone line inputs and including a multiple frequency signal generator on a complementary symmetry, metal oxide, semiconductor integrated circuitry chip for digitally synthesizing a dual-tone sinusoidal representative signal of a selected key on a keyboard comprising:

a keyboard decode means on the chip responsive to the keyboard for generating a keyboard signal representative of the selected key;

means on the chip responsive to the keyboard signal for generating a control signal in response to the selected key being enabled; and,

common switching means on the chip responsive to the control signal for performing the common switching functions of the telephone communication system during generation of the sinusoidal representative signal including means for enabling oscillatory circuitry in said multiple frequency generator, means for disabling an audio transmitter and means for attenuating the output of a receiver.

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**4,315,109**

## ELECTRONIC RING SOUNDER FOR A SPEAKER TELEPHONE

**Sava Jacobson, 8130 Orion Ave., Van Nuys, Calif. 91406**

**Filed Nov. 20, 1979, Ser. No. 96,017**
**Int. Cl.³ H04M *1/26***
**U.S. Cl. 179—84 T** **5 Claims**

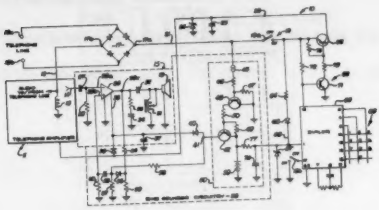
1. An electronic ring sounder for a speaker telephone of the type in which speech incoming from the telephone line is supplied to a speaker via a driver amplifier, comprising:

feedback means for causing audio oscillation of said amplifier,

ring enabling means, operatively connected to said telephone line, for enabling said feedback means in response to the presence of a ring signal on said telephone line, the resultant audio oscillation of said amplifier driving said speaker to produce a sound corresponding to a telephone bell,

said feedback means including a positive feedback circuit

connected between the output of said amplifier and the input thereof, said feedback circuit including a switchable element in series with an oscillation frequency determining element, and



wherein said ring enabling means switches on said switchable element in response to occurrence of said ring signal.

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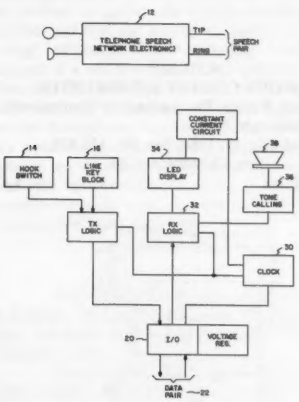
**4,315,110**
**MULTIPLE LINE TELEPHONE INSTRUMENT**
**James M. Davis, Corinth, Miss., assignor to International Telephone and Telegraph Corporation, New York, N.Y.**
**Filed Apr. 28, 1980, Ser. No. 144,780**
**Int. Cl.³ H04Q 5/18**
**U.S. Cl. 179—99 M** **9 Claims**




1. A multiple line telephone instrument having a pair of speech conductors and a pair of data conductors for bidirectional transfer of information between said instrument and a system to which the instrument is coupled, said instrument including a plurality of line buttons each representing a line having access to said instrument, said line buttons individually operable to an operative condition, means responsive to an operative condition of one or more said buttons for transmitting an asynchronous coded time division signal over said data pair, said transmitting means including means for emitting a pulse of first duration in response to the absence of an operative condition at the line buttons and for emitting a pulse of second duration in response to an operative condition of one or more of said line buttons, means for preventing the passage of more than one pulse at a time, means for inverting alternate ones of said pulses, and an output circuit having separate switching means with their switching outputs at opposite ends of a transformer winding whereby said alternate pulses actuate the switching means alternately to produce AC signal across said transformer winding.

**4,315,111**
**HEARING AID WITH REMOTE MOMENTARY SHUT OFF SWITCH**
**Charles A. Thomas, 609 S. Warson Rd., St. Louis, Mo. 63124**
**Filed May 29, 1980, Ser. No. 154,367**
**Int. Cl.³ H04R 25/00**
**U.S. Cl. 179—107 R** **15 Claims**

1. A battery powered hearing aid with a momentary contact shutoff switch in circuit with said hearing aid, said switch being adapted for mounting to the shoulder area of a hunting vest or the like, said switch having means to interrupt the electrical circuit of said hearing aid as pressure is applied thereto to thereby turn said hearing aid off.

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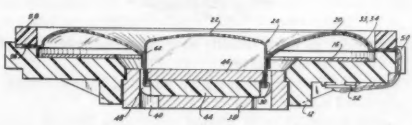
**4,315,112**
**SPEAKER**
**Alan Hofer, 1201 Tusk La., Wantagh, N.Y. 11793**
**Filed Dec. 12, 1979, Ser. No. 102,753**
**Int. Cl.³ H04R 7/16, 9/06**
**U.S. Cl. 179—115.5 R** **6 Claims**



1. A speaker comprising:
a housing having an open top end, a diaphragm assembly closing said top end; said diaphragm assembly comprising a first generally half-torrodial shaped diaphragm member formed of a fluoropolymer film and having an open center section and a second diaphragm member in the form of an inverted cup having a dome positioned in and closing said center section, said second diaphragm member being formed of a plastic film material dissimilar to said first diaphragm member film;
a voice coil wound directly about said cup;
a magnetic assembly positioned within said housing axially aligned with said cup, said magnetic assembly including a magnetic pole piece and permanent magnet magnetized parallel to the axis of said cup and a magnetic yoke, said yoke including portions extending about said pole piece and permanent magnet and spaced therefrom to form a gap within which said voice coil is captured.

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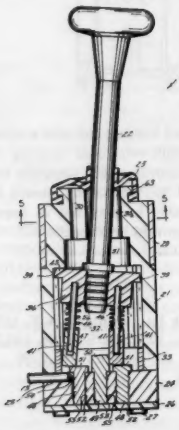
**4,315,113**
**ACTUATOR SWITCH FOR REMOTE CONTROL REARVIEW MIRRORS**
**Robert J. Fisher, Livonia, and Lawrence R. Lefever, Sterling Heights, both of Mich., assignors to Harman International Industries, Inc., Grandville, Mich.**
**Filed Jan. 18, 1980, Ser. No. 113,261**
**Int. Cl.³ H01H 9/26; G02B 5/08**
**U.S. Cl. 200—5 R** **4 Claims**

1. In an electrically operated remote control rearview mir-

ror structure having a pair of reversible drive motors, one drivably connected to move said mirror in one plane of motion and the other drivably connected to move said mirror in another plane for limited universal placement, the actuator control structure comprising:

a remotely connected switch having a first pair of opposed positions selectively operating one of said motors in a forward direction and in a reverse direction and said switch having a second pair of opposed positions and selectively operating the other of said motors in a forward and in a reverse direction;

bias means acting upon release of said switch and self-centering said switch to a neutral non-driving position;



a plurality of leads radially extending from the base of said switch to said motors;

a source of electrical energy connected to said switch;

a ground connected to said switch;

means actuated upon guided movement in said switch to close a circuit to one of said motors in selected forward and reverse and separately to the other of said motors in selected forward and reverse; and

a base closure on said switch having radial openings through which said leads radially extend and said base closure terminally supporting said leads in locating and electrical contact with said leads and said means.

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**4,315,114**

**KEYBOARD SWITCH ASSEMBLY**

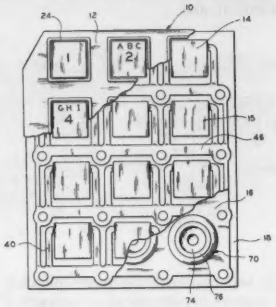
**James H. Monti, Jr., Corinth, Miss., assignor to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed Mar. 24, 1980, Ser. No. 133,566**

**Int. Cl.³ H01H *13/70***

**U.S. Cl. 200—5 A** **8 Claims**

1. A keyboard assembly comprising an appearance housing having a plurality of apertures in the face thereof arrayed in rows and columns, an array of headed push buttons, with one of said buttons extending outward of each of said apertures, said buttons independently operative to control the operation of respective switching paths, a rigid cross brace commonly connected to a row of buttons, a pair of resilient hinge arms affixed to each push button at the opposed sides thereof, said hinge arms extending from a connection to said cross brace spaced from a first end of said button past the body of the button to the affixation to the button adjacent an end of said button remote from the first end, each of said buttons constrained to substantially vertical movement within raised walls surrounding its respective aperture in the appearance housing, said cross brace held internally within said housing with said hinge arms extending adjacent the lower edges of the sides of the buttons within the appearance housing, whereby a downward force exerted on one of said buttons results in approximate translatory movement of said button.



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**4,315,115**

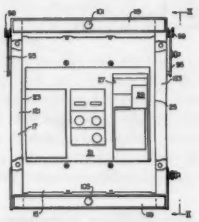
**DRAWOUT CIRCUIT INTERRUPTER**

**James O. Rexroad, Beaver, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Feb. 19, 1980, Ser. No. 122,408**

**Int. Cl.³ H01H *9/20***

**U.S. Cl. 200—50 AA** **5 Claims**

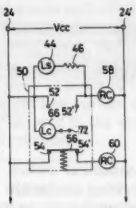


1. A circuit breaker structure comprising a base structure, a movable circuit breaker and spaced bus bars having conductor terminals, the circuit breaker including incoming and outgoing terminals, the circuit breaker being movable between electrically connected and disconnected positions of the terminals of the circuit breaker of the spaced bus bars, the terminals of the spaced bus conductors and of the circuit breaker having overlapping portions and having transverse aligned openings when the circuit breaker is in the connected position, releasable clamping means for holding the overlapping portions of incoming terminals in tight electrical surface-to-surface contact, said clamping means comprising an elongated bolt and nut assembly, the elongated bolt being disposed in the aligned openings, a sleeve being fixedly disposed on the bolt and having a non-circular outer periphery, each sleeve being seated in an aperture of locking inner periphery in said base structure for rotational immobilization of the sleeve, and a grounding conductor in contact with the bolt.

## 4,315,116
## SWITCH ASSEMBLY WITH LEAKAGE CURRENT DETECTING MEANS

**Koichi Kanamaru, Akigawa, and Misao Takeuchi, Tachikawa, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Jun. 8, 1979, Ser. No. 46,607**
**Claims priority, application Japan, Jun. 23, 1978, 53-75441**
**Int. Cl.³ H01H *3/16***
**U.S. Cl. 200—61.09** **8 Claims**




1. A system comprising, in combination:

a switch device including first and second spaced stationary contacts between which a predetermined electric potential may be applied, and a movable contact which is contactable with said first and second stationary contacts to complete electrical connection therebetween, the long term operation of said switch device showing a tendency to produce or gather electrically conductive substances around said first and second stationary contacts; and

a leakge indicating system including a terminal member located at a relatively short but predetermined distance from said first stationary contact, and an electrically operated warning device, said terminal member being connected through said warning device to said second stationary contact, whereby when electrically conductive substances are accumulated between said terminal member and said first stationary contact to form an electrically conductive path therebetween, said warning device is energized to issue a warning.

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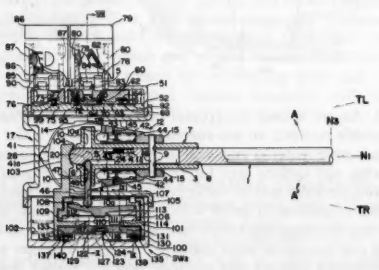
## 4,315,117
## ELECTRICAL SWITCH DEVICE

**Sadao Kokubu, Iwakura, and Nobuhiro Endou, Aichi, both of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan**

**Filed Feb. 19, 1980, Ser. No. 122,811**
**Claims priority, application Japan, Mar. 10, 1979, 54-30919[U]**
**Int. Cl.³ B60Q *1/00*; H01H *9/00***
**U.S. Cl. 200—61.27** **10 Claims**




1. An electrical switch, comprising:

a holder member reciprocatingly movable from a neutral position to operating positions on opposite sides of said neutral position;

an operating means engaged with said holder member for moving said holder member back and forth to said operating positions;

means associated with said operating means for normally holding said holder member at the neutral position and for automatically returning said holder member from the respective operating positions on the opposite sides of said neutral position to said neutral position when an operating force on said operating means is released;

a pair of spring pieces held on said holder member, said spring pieces extending out of the plane of movement of said holder member and being resiliently bendable toward and away from said holder member and oriented in opposite directions to each other, one being inclined toward one operating position and the other inclined toward the other operating position;

a base plate having a plate surface on which a plurality of stationary contacts are positioned;

a movable contact holder movable at least three steps in the same direction as one direction of movement of the holder member, said movable contact holder having contacts thereon for electrically connecting predetermined stationary contacts in different circuits at positions corresponding to each step;

a plurality of engaging projections on said contact holder, there being at least a subplurality of contacts equal to the number of steps on a line corresponding to the line along which one of said spring pieces moves and at least one on a line corresponding to the line along which the other of said spring pieces moves, said projections having engaging faces thereon engageable by said spring pieces for moving said contact holder during movement of said holder member;

means on said contact holder and said base plate cooperating for stopping and temporarily holding said contact holder at positions corresponding to each of said steps;

said projections having inclined surfaces on the sides thereof facing in the opposite direction to the engaging faces thereon for causing the spring pieces to ride over said projections during return movement of said holder member from an operating position to said neutral position; and

a fixed wall means between said holder and said holder member and having portions thereon for engaging the respective spring pieces during movement of said holder member for causing the spring pieces to be raised to pass over projections which are not desired to be engaged during movement of said holder.

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## 4,315,118
## ELECTRIC CENTRIFUGAL SWITCH

**Manfred Krämer, Schwieberdingen; Werner Schmid, Stuttgart, and Hans-Dieter Cramer, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Jul. 8, 1980, Ser. No. 166,889**
**Claims priority, application Fed. Rep. of Germany, Aug. 9, 1979, 2932299; Apr. 10, 1980, 3013858**
**Int. Cl.³ H01H *35/14***
**U.S. Cl. 200—80 R** **22 Claims**

1. An electric centrifugal switch, in particular for the purpose of safety shutoff upon attaining a shutoff rpm for fuel inejection systems, electrically controlled in an open- or closed-loop fashion, of internal combustion engines, comprising

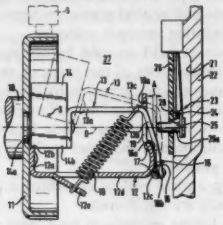
a housing,

a centrifugal pendulum in the form of a bell crank supported by a metal band bearing means on a carrier element connected with a drive shaft and having an electric switch attached to the housing,

the switch being provided with an actuation pin disposed in the extension of the rotary axis of the driveshaft,

the actuation pin being actuatable in the sense of interrupting contact by means of the centrifugal pendulum moving under centrifugal force and counter to the force of a restoring spring tensed between the centrifugal pendulum and the carrier element,

the centrifugal pendulum carrying a flyweight mass on the end of a first lever arm extending substantially in the direction of the rotary axis of the drive shaft,



the metal band of the band bearing being secured between a second lever arm of the centrifugal pendulum extending at least approximately perpendicularly to the rotary axis and a rolloff surface overlapping this lever arm and located on the carrier element and being held by the restoring spring (18) under tensile stress and in contact with the rolloff surface (12c, 12c').

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**4,315,119**

**TANK TYPE GAS CIRCUIT BREAKER**

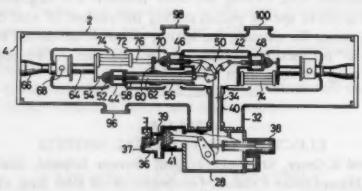
**Tuneo Kishi; Koji Sasaki, and Michio Moriya, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Dec. 26, 1979, Ser. No. 107,086**

**Claims priority, application Japan, Jan. 16, 1979, 54/2204; Jan. 24, 1979, 54/6056; Feb. 2, 1979, 54/10417**

**Int. Cl.³ H01H *33/14, 33/88***

**U.S. Cl. 200—145** **17 Claims**



1. A tank type gas circuit breaker having a sealed vessel which is filled with an insulating gas; an elongated insulating support within the sealed vessel and having one end thereof fixed to the sealed vessel; a hollow elongated bracket which is fixed to the other end of the insulating support; a plurality of interrupting units disposed within said sealed vessel; means for connecting said interrupting units in electrical series with each other; and linkage means disposed within said bracket for operating said interrupting units for opening and closure thereof; two of said interrupting units being disposed along axes which are substantially parallel to one another and both of said two units being located on one end face side of said bracket so as to be staggered in the direction of their axes, the one of said two interrupting units located adjacent the bracket side having its stationary contact member electrically connected with a movable contact member of the other interrupting unit at all times.

**4,315,120**

**LOAD DISCONNECTION SWITCH**

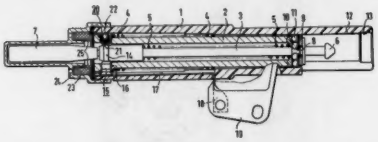
**Manfred Globig, Filderstadt, Fed. Rep. of Germany, assignor to Concordia Sprecher Schaltgerate GmbH, Fed. Rep. of Germany**

**Filed Sep. 4, 1979, Ser. No. 71,909**

**Claims priority, application Fed. Rep. of Germany, Feb. 27, 1979, 2907574**

**Int. Cl.³ H01H *33/04***

**U.S. Cl. 200—146 R** **15 Claims**



1. A load disconnection switch incorporating a quench chamber and comprising a tube-like housing, a telescope-like arrangement of a quench tube and a switch rod guided for relative axial movement within the tube-like housing and releasably connected together by a coupling system the release of which is dependent on relative movement between the quench tube and the housing and wherein the coupling system comprises at least one blocking device displaceably arranged in a radial guide of the quench tube, a recess provided in the switch rod and into which the blocking device is engageable to effect coupling between the quench tube and the switch rod, and a control wall of insulating material which limits the extent of radial movement of the blocking device and wherein the control wall has, at a location corresponding to the end of a predetermined initial relative movement between the quench tube and the tube-like housing an increase in cross-section which corresponds at least to the engagement depth of the blocking device in the recess whereby to allow decoupling of the quench tube and switch rod.

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**4,315,121**

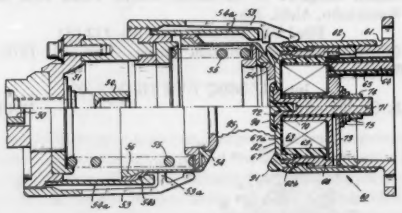
**SATURABLE MAGNETIC STEEL ENCASED COIL FOR ARC SPINNER INTERRUPTER**

**Robert K. Smith, Lansdale, Pa., assignor to Gould Inc., Rolling Meadows, Ill.**

**Filed May 11, 1979, Ser. No. 38,107**

**Int. Cl.³ H01H *33/18***

**U.S. Cl. 200—147 R** **8 Claims**



1. An arc spinner interrupter comprising, in combination: a movable contact; an arc runner disk formed of a flat disk of conductive material engageable by said movable contact, and having one surface area for receiving the arc root of an arc drawn between said movable contact and said arc runner disk; a coil connected in series with said arc runner disk; said coil having the shape of a toroid having a rectangular cross-section; said coil having an inner diameter, an outer diameter and first and second parallel end surfaces; said arc runner disk being fixed adjacent to said first end surface of said coil; a substantially static arc extinguishing fluid disposed in the region between said movable contact and said arc runner disk; and a

casing of magnetic material which is U-shaped in cross-section and which is fitted around said inner diameter, said second surface and said outer diameter of said coil; the ends of the legs of said U-shaped casing being adjacent to the inner and outer diameters respectively of said arc runner disk; said casing being of a magnetic material having a magnetic permeability greater than that of air and defining a relatively low reluctance magnetic path for magnetic flux around said coil and to the region between said one surface area of said arc runner disk and said movable contact; said interrupter having a rated interrupting current; at least portions of said casing of magnetic material being saturated by the field due to said coil when the current in said coil is less than said rated interrupting current but greater than some relatively low given value, and wherein said casing of magnetic material is unsaturated at coil currents lower than said relatively low given value in order to improve the ability of said interrupter to interrupt low current faults by having an increased flux density per ampere in the arcing region during relatively low current interruption.

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## 4,315,122
## CONTACT ARRANGEMENT

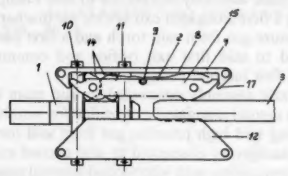
**Wilhelm Krämer, Sandhausen, and Joachim Gräfling, Ubstadt-Weiher, both of Fed. Rep. of Germany, assignors to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland**

**Filed Nov. 30, 1979, Ser. No. 98,791**

**Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2851738**

**Int. Cl.³ H01H *1/32***

**U.S. Cl. 200—248** **4 Claims**




1. A contact arrangement comprising:

a first contact;

a second contact having at least two contact members with the first contact being receivable between the two contact members, said contact members each including at least two conductive track parts separated by a gap, and fastening means for holding said conductive track parts together; and

contact support means for resiliently supporting said second contact so as to be both resiliently supported relative to the contact support means and movable relative to said first contact and such that said at least two contact members are both movable relative to each other and movable relative to the contact support means, said contact support means including first and second generally U-shaped supports, each of said U-shaped supports having two end portions between which one of said contact members is arranged; and bolt means for connecting both said U-shaped supports and said contact members with the contact support means.

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## 4,315,123
## SWITCHING APPARATUS ASSEMBLY STRUCTURE

**Teizo Fujita, Ibaraki, and Haruo Kimura, Settsu, both of Japan, assignors to Izumi Denki Corporation, Japan**

**Filed Apr. 9, 1980, Ser. No. 138,798**

**Claims priority, application Japan, Apr. 17, 1979, 54-47384**

**Int. Cl.³ H01H *9/02***

**U.S. Cl. 200—307** **29 Claims**

1. A switching apparatus assembly structure having a central axis and comprising at least one first block provided with a contact mechanism and adapted to be coupled to others in a multi-stage fashion, and a second block provided with an actuator mechanism for actuating said contact mechanism, said first block and said second block being detachably coupled to each other in the direction of said central axis, wherein

(A) said first block comprises:

(a) a first casing of a generally box-like form having its central axis registering with said central axis,

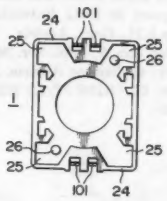
(b) at least one electrical contact means accommodated within said first casing,

(c) external lead-out terminal means electrically connected to said contact means, and

(d) first engaging means provided on said first casing for detachably coupling said first block to another block to be adjoined to said first block in the direction of said central axis; and wherein

(B) said second block comprises:

(a) a second casing having its central axis registering with said central axis, said second casing including a hollow




box-shaped section and a hollow cylindrical section extending from said box-shaped section in the direction of said central axis, said box-shaped section opening in a direction remote from said cylindrical section with respect to said central axis to define a hollow space divided into a substantially circular central cavity and small cavities located at the four corners of said box-shaped section and communicating with said central cavity, the hollow space of said cylindrical section and the central cavity of said box-shaped section communicating with each other to define an accommodation space extending through said second casing in the axial direction,

(b) manually-operated cylindrical actuator means movably accommodated within said accommodation space for turning on and off said contact means by actuating the same, and

(c) second engaging means cooperating with said first engaging means for detachably coupling said second block to said first block adjoining thereto.

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## 4,315,124
## HEATING MODULES FOR BILLETS IN INDUCTIVE HEATING FURNACES

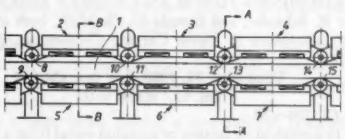
**Staffan Granstrom, and Gosta Karlsson, both of Vesteras, Sweden, assignors to ASEA Aktiebolag, Vesteras, Sweden**

**Filed Nov. 9, 1978, Ser. No. 959,215**

**Claims priority, application Sweden, Nov. 16, 1977, 7712917**

**Int. Cl.³ H05B *6/22, 6/44***

**U.S. Cl. 219—10.71** **10 Claims**




1. Inductive billet heating apparatus in an inductive heating furnace for billets having a rectangular section, comprising:

a plurality of paired heater modules having a flat shape;

a plurality of paired roller elements for feeding the billets between said plurality of heater modules;

each heater module in each pair of said heater modules being directly suspended from respective ones of said paired roller elements on opposite sides of a billet such that a substantially constant distance from the opposite surfaces of the billets to the respective heater modules in each pair of heater modules is maintained by movement of said paired roller elements on the respective opposite surfaces of the billet independently of the thickness and/or variations in thickness of the billet; and

each said pair of heater modules being independently rotatable in a plane substantially parallel to the confronting surfaces of the billets.

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**4,315,125**

## LATTICE WELDING MACHINE WITH DISC ELECTRODE

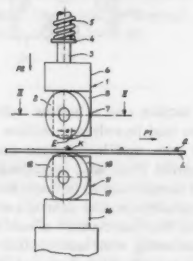
**Gerhard Schmidt; Klaus Ritter, and Gerhard Ritter, all of Graz, Austria, assignors to EVG Entwicklungs- u. Verwertungs-Gesellschaft m.b.H., Graz, Austria**

**Filed Jun. 9, 1980, Ser. No. 157,433**

**Claims priority, application Austria, Jun. 12, 1979, 4184/79**

**Int. Cl.³ B21F *27/10*; B23K *11/06***

**U.S. Cl. 219—56** **3 Claims**



1. In an electrical resistance welding machine for producing a wire lattice by welding together longitudinal and transverse wires at their crossover points, said machine comprising means for feeding said wires stepwise between at least one pair of electrode devices, and means synchronized with said feeding means for bringing said electrode devices together to clamp said wires at one of said crossover points therebetween, an improved electrode device which comprises an electrode holder, a welding electrode fitted to said electrode holder and adapted to transmit welding current from said electrode holder to said crossover points in turn, said welding electrode being in the form of a circularly cylindrical disc which is disposed on said electrode holder for rotation about the axis of said disc and is provided with means for fixing said disc in a selective angular position relative to said electrode holder, said axis extending at an acute angle to the direction of feed of said longitudinal wires.

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**4,315,126**

## METHOD OF AIR CUTTING AND GOUGING AND A COMBINED TORCH AND NOZZLE ASSEMBLY

**Peter R. Schaefer, and Donald W. Carkhuff, both of Florence, S.C., assignors to Union Carbide Corporation, New York, N.Y.**

**Filed May 29, 1980, Ser. No. 154,517**

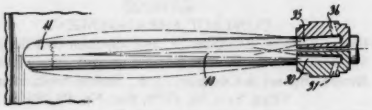
**Int. Cl.³ B23K *9/00***

**U.S. Cl. 219—70** **9 Claims**

1. In a method of cutting or gouging metal from a workpiece using an arc established between a carbon electrode and said workpiece in which the electrode is suspended from a torch having nozzle means for gripping the electrode and simultaneously directing a stream of high velocity gas toward said arc for blowing away molten metal from the workpiece while the torch is advanced along the workpiece in a predetermined path; the improvement comprising:

forming said high velocity gas stream by directing high velocity gas through at least two elongated exit orifices aligned relative to one another in a non-parallel relationship with each exit orifice directed toward said electrode such that the high velocity effluent from each orifice merges to form said stream of high velocity gas at a location substantially upstream of said arc and substantially about the centerline of said electrode.

5. In combination, an arc cutting and gouging torch having a main conductive body with a first internal passage through which high pressure gas is adapted to be fed, a clamping arm pivotally connected to said main conductive body and having a second internal passage through which said high pressure gas is also adapted to be fed, and nozzle means disposed between said clamping arm and said main conductive body for suspending an elongated carbon electrode in a radially adjustable position relative to the longitudinal axis of the torch; said nozzle means comprising:



an upper nozzle assembly connected to said clamping arm, including a first elongated exit orifice for discharging said high pressure gas from said torch and a first passageway connected to said first exit orifice and communicating with said first internal passage;

a lower nozzle assembly connected to said main body, including a second elongated exit orifice for simultaneously discharging said high pressure gas from said torch and a second passageway connected to said second exit orifice and communicating with said second internal passage; and

wherein said first exit orifice and said second exit orifice are disposed in a non-parallel relationship relative to one another each forming an included angle with the centerline of the electrode to cause said high pressure gas exiting from each orifice to merge at a location substantially upstream of the arc end of the electrode.

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**4,315,127**

## ELECTRO-SLAG WELDING METHOD

**Yoshinori Ito, Nishinomiya; Masahiko Ikeda, Ashiya, and Junji Furuichi, Nishinomiya, all of Japan, assignors to Sumitomo Metal Industries Limited, Osaka, Japan**

**Continuation of Ser. No. 710,331, Jul. 30, 1976, abandoned, which is a continuation of Ser. No. 510,595, Sep. 30, 1974, abandoned. This application Oct. 30, 1979, Ser. No. 89,485**

**Claims priority, application Japan, Oct. 6, 1973, 48-112669; Oct. 6, 1973, 48-112670**

**Int. Cl.³ B23K *25/00***

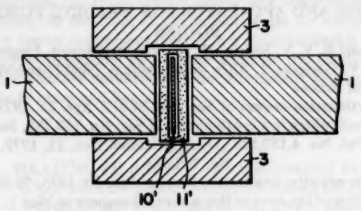
**U.S. Cl. 219—73.1** **1 Claim**

1. An electro-slag welding method which requires the use of reduced amounts of welding materials, said method comprising:

(a) fixedly positioning the elements to be welded together by means of opposed metal clamping members so as to form between the elements to be welded a substantially vertically extending gap of no more than about 20 mm, said elements to be welded together having substantially equivalent thicknesses,

(b) positioning in said gap a strip of mild steel as a consumable electrode, said strip of mild steel having a thickness of between 0.5 and 1.5 mm and a width substantially equal to thicknesses of the elements to be welded together, said

strip of mild steel being encased in hollow, rectangular-shaped tube consisting of an electrically insulating material molded around a metal net core, said electrically insulating material comprising a mixture of a slag-forming agent, a deoxidizing agent and an alloying agent, and




(c) passing electrical current through said strip of mild steel to melt portions of said steel strip and said electrically insulating material and accomplish said welding, while feeding said strip of mild steel through said hollow, rectangular-shaped tube.

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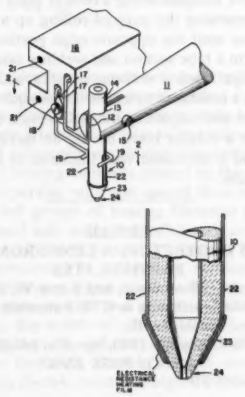
**4,315,128**

## ELECTRICALLY HEATED BONDING TOOL FOR THE MANUFACTURE OF SEMICONDUCTOR DEVICES

**Thomas J. Matcovich, Maple Glen, and Dan Valenski, Hatboro, both of Pa., assignors to Kulicke and Soffa Industries Inc., Horsham, Pa.**

**Filed Apr. 7, 1978, Ser. No. 894,344**
**Int. Cl.³ B23K *3/00*; H05B *3/16***
**U.S. Cl. 219—85 D** **11 Claims**




1. A heated bonding tool for the manufacture of semiconductor devices comprising:

a high density non-porous alumina electrically insulating bonding tool, said bonding tool including a mounting portion at one end, a working portion at the other end and a tapered portion converging toward said working tip portion, the outer surface of said bonding tool being electrically insulative,

an electrically conductive-resistive thick film deposited over said outer surface of said tapered portion of said bonding tool intermediate said mounting portion and said working tip portion leaving said working tip exposed,

said thick film being capable of heating said exposed working tip of said bonding tool up to 600° C. when an electrical current is passed through said conductive-resistive thick film,

said thick film consisting of a matrix of conductive-resistive material,

a pair of thick film contact terminal pads deposited on said outer surface of said mounting portion and forming a continuation of said conductive-resistive thick film for connecting said conductive-resistive thick film to a source of electrical current, and

said thick film contact terminal pads being adapted to be connected to said source of electrical current.

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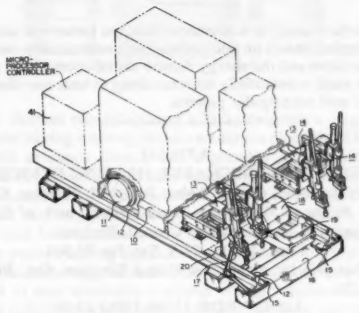
**4,315,129**

## MOBILE APPARATUS FOR WELDING STUDS TO RAIL BASE PLATES

**Harold C. Wilkinson, Medford; Angelo M. D'Attoma, Moorestown, both of N.J., and Stephen W. Walker, Louisville, Ky., assignors to Omark Industries, Inc., Portland, Oreg.**

**Filed Oct. 15, 1979, Ser. No. 85,016**
**Int. Cl.³ B23K *9/20*; E01B *29/16***
**U.S. Cl. 219—99** **15 Claims**




12. The method of positioning and welding, on site, rail retaining clip studs to existing railroad rail plates comprising the steps of:

moving along the rails at a predetermined speed a railway car assembly including welding gun assemblies adapted to extend from the railway car assembly to the rail plates to weld studs thereupon and carried by a carriage assembly capable of moving the welding gun assembly in both transverse and longitudinal directions in respect to the rail plate;

sensing the approach of a rail plate and stopping the railway car assembly at a position wherein the stud is in longitudinal position in respect to the rail plate; and

sensing the position of the stud in respect to the rail plate transverse to the rail plate and moving the carriage assembly to properly position the stud in respect to the rail plate.

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**4,315,130**

## METHOD OF TREATING OBJECT BY LASER BEAM AND APPARATUS THEREFOR

**Masahisa Inagaki, Hitachi; Ryutarou Jinbou, Hitachiota; Tomio Unino, and Tomohiko Shida, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Feb. 28, 1979, Ser. No. 16,167**
**Claims priority, application Japan, Mar. 3, 1978, 53/23525**
**Int. Cl.³ B23K *27/00***
**U.S. Cl. 219—121 L** **9 Claims**

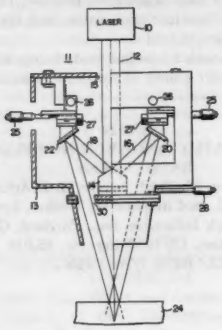
1. A method of treating an object by a laser beam in which the object to be treated is irradiated by the laser beam, comprising the steps of:

emitting a laser beam having a non-uniform symmetrical pattern of energy distribution from a laser apparatus;

dividing said laser beam along at least one line of symmetry into a plurality of fractional laser beams each having a

cross-sectional area which is equal to the cross-sectional area of the other fractional laser beams; and

directing said plurality of fractional laser beams into overlapping relationship directly onto the surface of the object




to be treated, in a manner so that the pattern of said overlapping beams on said surface has a substantially-rectangular form and the energy density distribution of said pattern is made substantially uniform along at least one dimension of said rectangular pattern.

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**4,315,131**

## ELECTRON DISCHARGE HEATING DEVICES

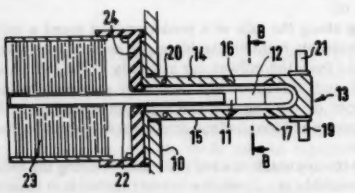
**Rodney Townend, Clwyd, Wales; Joseph B. Wareing, Chester, and Raymond Winstanley, South Wirral, both of England, assignors to The Electricity Council, England**

**Filed Oct. 16, 1979, Ser. No. 85,364**

**Claims priority, application United Kingdom, Oct. 30, 1978, 42448/78**

**Int. Cl.³ B23K *15/00*; H01J *37/06***

**U.S. Cl. 219—121 EB** **2 Claims**




1. A glow discharge heating device for the continuous heat treatment of an elongate workpiece movable through the heating device, said heating device comprising a plurality of wall members defining a vacuum chamber, an electron discharge gun having anode and cathode electrodes in said chamber; said cathode electrode comprising an elongate plate member mounted in one wall of the chamber to extend into the chamber and having a circular aperture through the plate member near the end thereof in the chamber; said anode electrode comprising two plate members, one on each side of, adjacent to, and parallel with the cathode electrode; each anode plate member having a circular aperture therethrough axially aligned with the aperture in the cathode electrode; means for applying an electric potential between the cathode and anode electrodes while maintaining the anode electrode at earth potential to produce an electron discharge focussed on the axis of the apertures; means for passing an elongate workpiece through the vacuum chamber and through the electrode apertures along the axis thereof; means defining ducts in each of the anode members; means for circulating a coolant fluid through said ducts; at least one heat pipe member partially within the cathode electrode and extending within the cathode electrode from a point adjacent the cathode aperture through the wall of the chamber; and a plurality of heat dissipating cooling surfaces outside the chamber and contacting the pipe member to dissipate heat therefrom.

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**4,315,132**

## PROCESS AND APPARATUS FOR WELDING TUBULAR BODIES

**Emmanuel E. V. V. Saurin, 28, rue Eugéne Prevost, Lagny, and Ezio V. Gariglio, 1, Allée du Roussillon, Neuilly-sur-Marne, both of France**

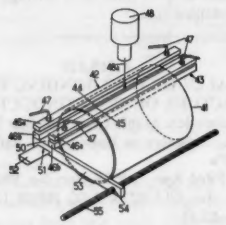
**Continuation-in-part of Ser. No. 34,015, Apr. 27, 1979, abandoned, which is a continuation of Ser. No. 758,785, Jan. 12, 1977, Pat. No. 4,152,573. This application Dec. 21, 1979, Ser. No. 105,873**

**Claims priority, application France, Jan. 20, 1976, 76 01400**

**The portion of the term of this patent subsequent to May 1, 1996, has been disclaimed.**

**Int. Cl.³ B23K *27/00***

**U.S. Cl. 219—121 LD** **10 Claims**




1. Process for manufacturing a tubular body for a preserved food can, comprising the steps of rolling up a metal sheet of small thickness until the opposite edge portions of the sheet contact to form a tube section and welding said edge portions in edge to edge relation without overlap with a laser beam which insures a resistance to tensile forces equivalent to that of the metal sheet and subjecting the tube section to radial expansion to obtain a tubular body having an increased cross-sectional area and a decreased wall thickness as compared with said tube section.

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**4,315,133**

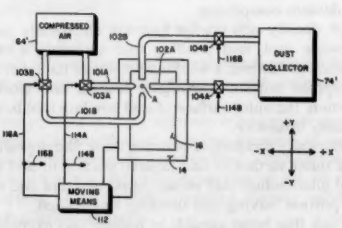
## APPARATUS PROTECTING A LENS FROM AIRBORNE PARTICULATES

**John H. Morgan, Albuquerque, and Larry W. Sutton, Peralta, both of N. Mex., assignors to GTE Automatic Electric Laboratories, Inc., Northlake, Ill.**

**Filed May 12, 1980, Ser. No. 149,804**

**Int. Cl.³ B23K *27/00***

**U.S. Cl. 219—121 FS** **8 Claims**




1. In an optical system including a lens with an exterior surface through which a laser beam passes, the laser beam being directed in a straight line for contacting the workpiece,

first means providing multidirectional relative movement of the workpiece with respect to the line and laser beam in a plane orthogonal to the line, and second means producing a directional stream of gas moving between the lens and workpiece and across the line for protecting the exterior lens surface by impeding contaminant particulates of the workpiece contacting the lens, the improvement comprising machine means for adjusting the direction of the stream of gas for maintaining a major vector component thereof in a direction that is one of a direction orthogonal to and the same as the direction of a current relative movement of the workpiece with respect to the laser beam and line.

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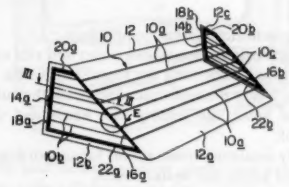
## 4,315,134
## HEATING FILAMENT ARRANGEMENT FOR UNIFORMLY ELECTRICALLY HEATING A VEHICULAR WRAP-AROUND TYPE REAR WINDOWSCREEN

**Kiyoto Matsuzaki; Shojiro Seki, and Norimoto Aya, all of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed May 11, 1979, Ser. No. 38,275**
**Claims priority, application Japan, May 17, 1978, 53-64963**
**Int. Cl.³ H05B *3/06*; E06B *7/12*; A47L *1/16*; B60J *1/20***
**U.S. Cl. 219—203** **3 Claims**




1. An electric demister for preventing a windowscreen from being misted, said windowscreen comprising a gently sloping main section and steeply sloping side sections between which said main section is interposed so as to be inclined with respect to each of said side sections, said demister comprising:

a first group of heating filaments printed on the surface of said main section parallel with and spaced from each other;

second and third groups of heating filaments printed on the surfaces of said side sections parallel with and spaced from each other, said second and third groups of filaments being integrally connected in one-to-one relation to said first group of filaments at ridges of said windowscreen by which ridges said main section and said side sections are bound respectively, the width of each of said second and third groups of filaments being less than that of said first group of filaments so that each filament of said second and third groups has an electric resistance higher than that of said first group;

first highly conductive strips printed on said side sections respectively, each having a top end and a bottom end, the leading ends of the filaments of the second and third groups being each connected to said first highly conductive strips;

terminals respectively formed on said first highly conductive strips for connecting said strips to an electric power source;

second highly conductive strips, each having a top end and a bottom end, printed on said ridges respectively to extend along the same so as to cross the connecting parts of the filaments of said first and second groups and said first and third groups to connect the connecting parts; and

third highly conductive strips printed on said side sections respectively to connect said top ends of said first and second highly conductive strips and to connect said bottom ends of said first and second highly conductive strips, the electric resistance of each of said third highly conductive strips being lower than that of each of the filaments of said second and third groups and being selected to provide uniform heating throughout said windowscreen.

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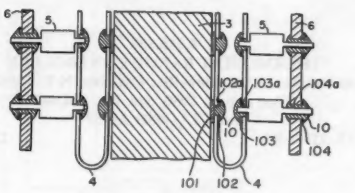
## 4,315,135
## THERMAL RECORDING HEAD

**Fumitake Tokugawa, and Etsuo Hatabe, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 21, 1979, Ser. No. 68,341**
**Claims priority, application Japan, Aug. 21, 1978, 53-101975; Sep. 12, 1978, 53-112615**
**Int. Cl.³ H05B *1/00***
**U.S. Cl. 219—216** **6 Claims**




1. A thermal recording head which comprises a supporting substrate having a wiring pattern wherein a plurality of heating elements arranged linearly and a plurality of lead-out wires connected respectively to each heating element are formed on the end surface and said lead-out wires are elongated to the adjacent side surface; selective terminals connected to a plurality of said heating elements; a first wiring substrate having a wiring pattern having signal terminals for applying a selective signal for selecting the heat elements and a diode matrix connected to said terminals; a second wiring substrate having a wiring pattern for connecting said diode matrix to said lead-out wires; and a plurality of diodes which are connected between said wiring patterns and which form said diode matrix in the space facing said wiring patterns.

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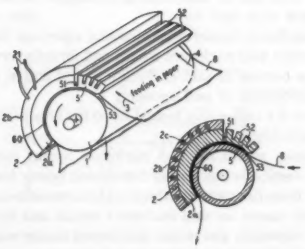
## 4,315,136
## THERMIC DEVELOPING STATIONS

**Dieter Block, Kiel; Reinhard Gesell, Schoenkirchen, and Hans-Werner Peters, Raisdorf, all of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany**

**Filed Dec. 3, 1979, Ser. No. 99,585**
**Claims priority, application Fed. Rep. of Germany, Dec. 2, 1978, 2852250**
**Int. Cl.³ H05B *1/00***
**U.S. Cl. 219—216** **11 Claims**




1. A thermal development station for recording material to be developed by means of heat, comprising: a rotatable drum; an electrical heating element with an associated directly heated base member having a curved surface corresponding to a curvature of a surface of the drum and being positioned such that a recording material can be transported through by the

drum in a gap between the drum and the heating element base member as the drum rotates; and a thermally isolated member which is substantially less heated than portions of the heating element base member likewise having a curved surface corresponding to the curvature of the drum surface and provided at an entry point for the recording material into a heated zone between the drum and the heating element base member.

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**4,315,137**

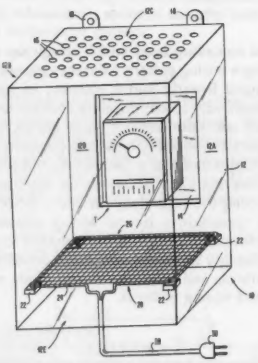
## THERMOSTAT RANGE CONTROLLER

**Harald Dahms, 22 Lakeview Rd., Ossining, N.Y. 10562**

**Filed Jun. 2, 1980, Ser. No. 156,043**

**Int. Cl.³ G05D *23/30***

**U.S. Cl. 219—391** **22 Claims**



1. A thermostat range controller adapted for use with a wall mounted thermostat, comprising:

an enclosure means separate from a thermostat and its housing, adapted to be mounted on a wall supporting said thermostat in a position such that said enclosure means surrounds said thermostat, said enclosure means including a back wall thereof having an opening therein through which said thermostat projects when said enclosure means is attached to said wall in a manner to be substantially flush with said wall,

a distributed heater means having openings therein located within said enclosure means and directly vertically above the bottom of said enclosure means and at a level below the bottom of said opening,

means for conveying heated air to the area of said thermostat including:

intake means on said enclosure means located directly vertically below said distributed heater for receiving air from the room in which said thermostat is mounted, and

exit means on said enclosure means and located directly vertically above said distributed heater means for allowing heated air within said enclosure means to exit from said enclosure means,

wherein the volume of said enclosure means is greater than the volume of said thermostat and wherein the flow of air through said enclosure means is in a substantially vertical path from said intake means to said exit means.

**4,315,138**

## ELECTRIC RICE COOKER

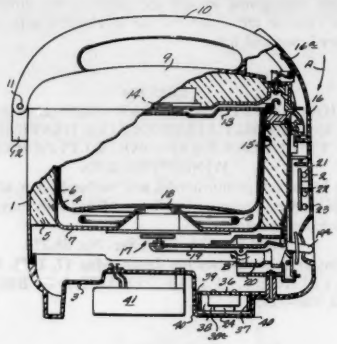
**Yoshiyuki Miwa, Aichi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Apr. 23, 1980, Ser. No. 143,122**

**Claims priority, application Japan, May 21, 1979, 54-63117; May 22, 1979, 54-69369[U]**

**Int. Cl.³ F27D *11/02***

**U.S. Cl. 219—441** **10 Claims**



1. An electric rice cooker comprising:

a cooking kettle for containing water and rice to be cooked;

a removable lid covering the top of said kettle;

electrical heater means mounted adjacent the outside surface of said kettle for heating said kettle and the contents thereof;

thermally insulating frame means for supporting and enclosing said kettle and heater means;

a face cover for covering at least a front portion of said frame means, said frame means and face cover forming a case;

circuit means for connecting and disconnecting said heater means from a source of electrical energy to carry out a plurality of cooking steps in a predetermined period including a thermoswitch for detecting the temperature of said kettle and having a first position connecting said source to said heater for heating said kettle and contents and a second position disconnecting said heater means in response to detection of a predetermined temperature;

electric timer means having controlled switches for controlling connection of said source to said heater means; and

heat isolating means mounted on said case and disposed between said timer means and heater means for preventing heat from said heater means from being transferred to said timer means.

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**4,315,139**

## ELECTRIC RICE COOKER

**Masayuki Onishi, Nagoya, and Yoshiyuki Miwa, Aichi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Apr. 24, 1980, Ser. No. 143,151**

**Claims priority, application Japan, May 22, 1979, 54-63727; Jun. 1, 1979, 54-69048**

**Int. Cl.³ F27D *11/02***

**U.S. Cl. 219—441** **6 Claims**

1. An electric rice cooker for cooking rice in a cycle including at least main cooking and twice cooking steps comprising:

a cooking kettle for containing water and rice to be cooked;

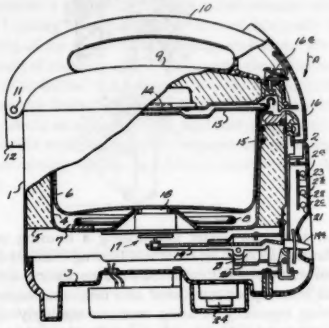
a removable lid covering the top of said kettle;

thermally insulating frame means for supporting and enclosing said kettle;

electrical heater means mounted on said frame means adjacent

the outside surface of said kettle for heating said kettle and the contents thereof;

circuit means for connecting and disconnecting said heater means from a source of electrical energy to carry out a plurality of cooking steps in a predetermined period including a thermoswitch for detecting the temperature of said kettle and having a first position connecting said source to said heater for heating said kettle and contents and a second position disconnecting said heater means in response to detection of a predetermined temperature, timer means having a first controlled switch in a first position connecting said timer means to said source through said thermoswitch to actuate said timer means when said thermoswitch is in said first position, said first switch being shifted to a second position by said timer means a first predetermined time after actuation to disconnect said timer means from said source and said timer means being reactuated when said thermos-



witch is in said second position connecting said source to said timer means through said first switch in said second position and having a second controlled switch connecting said heater means to said source through said thermoswitch in said second position for a second predetermined time period beginning a third predetermined time after reactivation of said timer means; and

means for displaying the steps of said cycle being carried out including a first display lamp connected to said thermoswitch for illumination when said thermoswitch is in said first position to indicate main cooking, and a serially connected third switch controlled by said timer means and a second display lamp, said second lamp and third switch being connected in parallel with said timer means, said third switch being closed when said second switch is in said second position for illumination of said second lamp to indicate twice cooking.

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**4,315,140**

## ENERGY SAVING DISHWASHER

**William F. Helwig, Jr., Downers Grove, Ill., assignor to Avtec Industries, Inc., Downers Grove, Ill.**

**Continuation-in-part of Ser. No. 77,135, Sep. 19, 1979, Pat. No. 4,254,788. This application Jul. 30, 1980, Ser. No. 173,770**

**Int. Cl.³ H05B *1/02***

**U.S. Cl. 219—486** **7 Claims**

1. A control circuit for conserving electrical energy in a dishwashing machine comprising

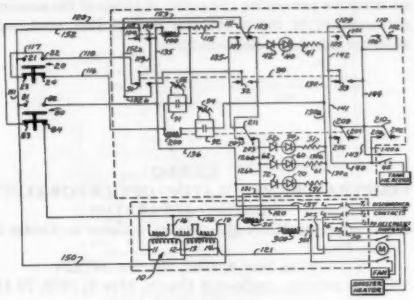
control means for automatically actuating various components during the operation of the dishwashing machine including at least one booster heater and one tank heater,

said control means being coupled to a source of electrical power and preventing simultaneous operation of the booster heater and tank heater of the dishwashing machine,

said control means further including connector means to couple the tank heater and booster heater to an electrical power source to supply power thereto,

said control means further including actuator means being responsive to the commencement of a cycle of operation of the dishwashing machine to simultaneously interrupt the power directed to the tank heater and supply power to the booster heater;

delay means operatively coupled to said actuator means and the tank and booster heaters to interrupt power directed to the booster heater and supply power to the tank heater in a predetermined time interval after the actuator means senses the presence of the commencement of the cycle of operation of the dishwashing machine; and



a plurality of contacts adaptable to be coupled to the operative input of various types of dishwashing machines, said plurality of contacts being electrically coupled to said control means including at least one of said contacts being electrically connected to said connector means for supplying electrical power of the dishwashing machine, at least another one of said contacts being connected to said actuator means to simultaneously interrupt the power directed to the tank heater and supply power to the booster heater of the dishwashing machine, and at least another one of said contacts being connected to said delay means to interrupt the power directed to the booster heater and supply power to the tank heater of the dishwashing machine in said predetermined time interval.

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**4,315,141**

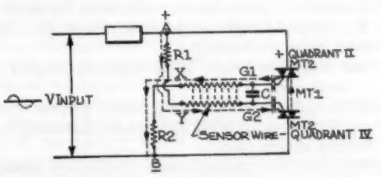
## ELECTRICAL HEATING APPARATUS WITH OVERHEATING PROTECTION

**Edwin R. Mills, Raleigh, and Ernest L. Elmore, Smithfield, both of N.C., assignors to Fieldcrest Mills, Inc., Eden, N.C.**

**Filed Sep. 5, 1980, Ser. No. 184,201**

**Int. Cl.³ H05B *1/02***

**U.S. Cl. 219—505** **7 Claims**




1. An electrical heating apparatus protected against an overheating condition and against a switch failure condition and comprising electrical heating means for generating heat upon flow of electrical current therethrough, overheat protection means including temperature sensitive impedance means thermally coupled to said electrical heating means for sensing the

occurrence of an overheating condition therein, a pair of gate controlled bidirectional semiconductor switches electrically connected to one another in series and in front-to-front orientation, means electrically connecting said pair of semiconductor switches to said heating means for controlling the flow of electrical current thereto, and means electrically coupling the gate of each one of said semiconductor switches to the gate of the other one of said semiconductor switches through said temperature sensitive impedance means for triggering of the semiconductor switches from a conductive to a nonconductive state in response to the sensing of an overheating condition by said temperature sensitive impedance means, said last named means electrically connecting the gate of each one of said semiconductor switches to the other one of said semiconductor switches for preventing triggering of either of the semiconductor switches in the event that one of said semiconductor switches fails in shorted condition.

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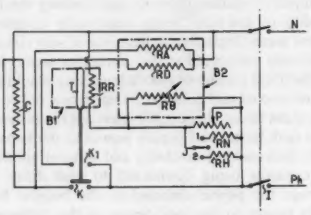
**4,315,142**

## TEMPERATURE REGULATING DEVICE FOR ELECTRIC HEATING APPARATUS

**Jean-Paul Henault, Houdan, France, assignor to Airelec Industries, France**

**Filed May 6, 1980, Ser. No. 147,239**
**Claims priority, application France, May 8, 1979, 79 11612**
**Int. Cl.³ H05B *1/02***
**U.S. Cl. 219—511** **4 Claims**




1. A temperature regulating device for controlling the operation of an electric heating apparatus of the type having a power supply and a space heating element, the device including the combination of

a thermostat;

switch means actuated by said thermostat between a first position for connecting the power supply to the heating element and a second position;

a regulating resistor and a temperature variable resistor connected in series circuit relationship, the series circuit thus formed being adapted to be electrically connected aross the power supply,

said regulation resistor being thermally coupled to said thermostat;

a differential correction heating resistor adapted to be electrically connected in parallel circuit relationship with the heating element; and

a shift correction heating resistor electrically connected to said switch means for energization by the power supply when said switch means is in said second position,

said shift correction heating resistor having a time constant which is different from the time constant of said differential correction heating resistor, and

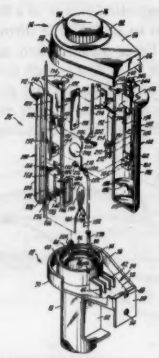
said differential correction heating resistor and said shift correction heating resistor being thermally coupled to said temperature variable resistor.

**4,315,143**

## AQUARIUM HEATER

**Allan H. Willinger, 351 E. 84th St., Apt. 21-E, New York, N.Y. 10028, and Tsuyoshi Itakura, Itakura Soki Kabushiki Kaisha, 17-20 Unoki 3-Chome, Ohta-Ku, Tokyo, Japan**

**Division of Ser. No. 63,049, Aug. 2, 1979, Pat. No. 4,255,648.**
**This application Oct. 27, 1980, Ser. No. 201,138**
**Int. Cl.³ H05B *3/80, 1/02***
**U.S. Cl. 219—523** **11 Claims**



1. An aquarium heater comprising a housing and a tube depending therefrom, an electrical heating element disposed in a bottom portion of said tube and a thermostatic control chassis disposed in an upper portion of said tube, said control chassis comprising opposing housing sections matingly engaged in nesting relationship to provide a cylindrical housing unit having an outer wall snugly fitting within said tube, a base wall transversely separating the bottom portion of said tube therefrom, and a transverse top wall, means for securely retaining said housing sections together, bimetallic thermostatic switch means securely mounted within said cylindrical housing unit in circuit with said heating element, and adjustment means on said housing for adjusting the position of said switch means to thereby control temperature setting of the heater.

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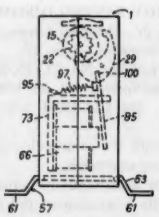
**4,315,144**

## ELECTRICAL IMPULSE OPERATED NUMBER WHEEL COUNTERS

**Hans Bud, London, and Peter Alway, Bushey, both of England, assignors to Mecom Standard Limited, London, England**

**Filed Dec. 11, 1979, Ser. No. 102,330**
**Claims priority, application United Kingdom, Dec. 14, 1978, 48535/78**
**Int. Cl.³ G06M *1/02***
**U.S. Cl. 235—92 C** **9 Claims**




1. An electrical impulse operated number wheel counter, comprising a housing, a first shaft inside the housing, a series of coaxial freely rotatable number wheels mounted on the first shaft, a second shaft inside the housing disposed parallel with

the first shaft, transfer pinions freely rotatably mounted on the second shaft respectively disposed intermediate successive number wheels, each pinion meshing with gear teeth on one of the number wheels adjacent thereto and adapted to engage drive means on the other number wheel during rotation of said other number wheel, thereby partially to rotate said one of the number wheels, reciprocably movable pawl means adapted to engage teeth on a number wheel at an end of the series of number wheels, thereby to rotate said number wheel to effect counting of the counter, and electrical impulse actuated means having a frame, a solenoid mounted on the frame, an armature supported for reciprocal movement on the frame and biassing means serving, when the solenoid is de-energised, to keep the armature out of engagement with the solenoid, the armature serving to effect reciprocal movement of the pawl means when an electrical impulse energises the solenoid; wherein the housing is formed of two parts of non-magnetic material which together provide a cavity for the electrical impulse actuated means, the housing having elements formed integrally therewith inwardly of the cavity which engage said frame and form the sole means of locating and retaining said electrical impulse actuated means within the housing, wherein the armature is supported on the frame for generally pivotal movement relative thereto about an axis parallel to said first and second shafts and wherein the armature directly engages the pawl means in a manner permitting relative movement therebetween radially of said axis.

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**4,315,145**

## MAGNETIC RECORDING STRUCTURE

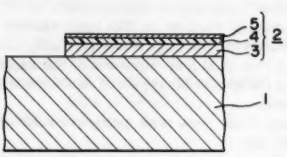
**Seiichi Nishikawa, Koganei, and Makoto Honda, Kamifukuoka, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 832,738, Sep. 12, 1977, abandoned. This application Apr. 18, 1980, Ser. No. 141,489**

**Claims priority, application Japan, Sep. 14, 1976, 51-122944; Sep. 14, 1976, 51-122945**

**Int. Cl.³ G06K *19/00***

**U.S. Cl. 235—493** **13 Claims**




1. A decoratively colored magnetic recording card, bankbook, or ledger including a substrate of a paper or a plastic sheet having an outer surface and a laminar magnetic recording piece disposed adjacent to at least one part of the outer surface of the substrate, said recording piece having a dark-colored magnetic layer for storing magnetically recorded information for subsequent readout, the improvement wherein the laminar magnetic recording piece further comprises:

a nonmetallic decorative color layer comprising an ink containing a pigment or a dye and a binder principally composed of a natural or synthetic resin and

a non-magnetic light-colored metal deposition layer interposed between the magnetic layer and the nonmetallic color layer, said magnetic layer being closer to the substrate than the color layer, the non-magnetic metal deposition layer having a thickness between about 0.02 micron and about 0.1 micron sufficient to hide the color of the magnetic layer, and the combined thickness of the non-magnetic metal layer and the decorative color layer being less than the thickness of the decorative color layer alone that would be required to hide the color of the magnetic layer, whereby a decorative color layer is provided without impairing the readout characteristics of the magnetic recording structure.

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**4,315,146**

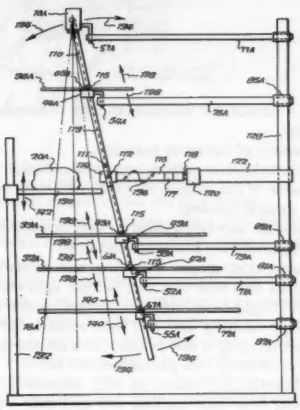
## PROCESS AND APPARATUS FOR SCATTER REDUCTION IN RADIOGRAPHY

**Stephen Rudin, Williamsville, N.Y., assignor to The Research Foundation of State University of New York, Albany, N.Y.**

**Continuation of Ser. No. 67,282, Aug. 17, 1979, abandoned. This application Jul. 17, 1980, Ser. No. 169,887**

**Int. Cl.³ G01N *23/00***

**U.S. Cl. 250—515** **36 Claims**



1. An apparatus for reducing detection of radiation scatter from an object through which high energy radiation passes within a flux pyramid from a source to a radiation detection means, said apparatus comprising:

(a) a series of at least two radiation shields, each of said shields having a front surface and a rear surface, said front and rear surfaces being large relative to the thickness of the shield;

(b) means for rotatably mounting said shields, in a spatially separated relationship with each other, between the object and the detection means, and so each of said shields covers an entire section of the flux pyramid and is rotatable about its own central axis through its center of gravity, and so the front surface of each shield faces toward said source and the rear surface of each shield faces away from said source;

(c) means for rotating each of said shields at its own angular velocity at a constant angular velocity ratio; and

(d) means for changing the relationship of the source, object, detector and shields to each other from initial positions while the object, detector and shields all continue to remain in planes parallel to the planes of the initial positions and continue to intersect the flux pyramid while constant proportional distances are maintained;

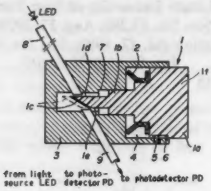
each of said shields being provided with a series of openings, smaller than the object, passing through the shield from the front to the rear surface, which openings allow radiation to pass through the shield from the source to the detection means, each of said shields being provided with such openings in shapes and positions such that at least a portion of radiation in a straight line from said source toward said detection means passes through openings in all of said shields to strike the detection means in essentially uniform coverage of said detection means when said object is absent, when the source is uniform and when each of said shields is in rotation about its central axis at its own angular velocity at a constant angular velocity ratio.

**4,315,147**

## PHOTOELECTRIC SWITCH WITH VISIBLE SIGNAL

**Alan L. Harmer, Bernex, Switzerland, assignor to Battelle Memorial Institute, Carouge, Switzerland**

**Filed Feb. 15, 1980, Ser. No. 121,700**
**Int. Cl.³ G02B 5/14**
**U.S. Cl. 250—227** **7 Claims**




1. A device for photoelectrically controlling a load, comprising:
a source of luminous radiation;
a photodetector responsive to said radiation for changing the state of conduction of a load-operating circuit;
an opaque housing;
a shutter member guided in said housing for displacement between two alternate positions;
fiber-optical means with first and second light-receiving ends and with first and second light-emitting ends, said first light-receiving end confronting said source, said first light-emitting end and said second light-receiving end terminating in said housing, said second light-emitting end confronting said photodetector; and
light-reflecting means on said member juxtaposable with said first light-emitting end and with said second light-receiving end for directing incoming rays from said first light-emitting end out of said housing as a visible signal while preventing illumination of said second light-receiving end in one of said alternate positions and for establishing a light path between said first light-emitting end and said second light-receiving end in the other of said alternate position to irradiate said photodetector from said source.

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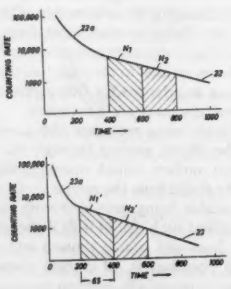
**4,315,148**

## METHOD AND APPARATUS FOR MEASURING NEUTRON CHARACTERISTICS OF MATERIAL SURROUNDING A BOREHOLE

**Russel R. Randall, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.**

**Filed Jun. 6, 1980, Ser. No. 156,971**
**Int. Cl.³ G01V 5/00**
**U.S. Cl. 250—262** **28 Claims**




1. A method for logging the formations surrounding an earth borehole, comprising:
pulsedly irradiating said formations with discrete bursts from a source of high energy neutrons;
detecting radiations emanating from said irradiated formations at a detector spaced from said source;
measuring said detected radiations during first and second fixed time duration intervals following a burst from said source;
measuring said detected radiations during third and fourth fixed time duration intervals following a subsequent burst from said source; and
controlling automatically the starting time of said third and fourth measurement intervals in accordance with said measurement from said first and said second time intervals.

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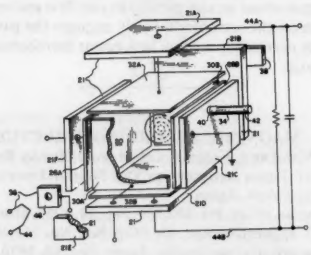
**4,315,149**

## MASS SPECTROMETER

**Edward B. Ledford, Jr., Lincoln, Nebr., assignor to The Board of Regents of the University of Nebraska, Lincoln, Nebr.**

**Filed May 23, 1980, Ser. No. 152,613**
**Int. Cl.³ B01D 59/44**
**U.S. Cl. 250—282** **33 Claims**



1. A method of identifying particles comprising the steps of:
injecting a sample containing particles to be identified into an ICR mass spectrometer within an enclosure that forms a part of a one-region analyzer cell;
maintaining a vacuum in the main vacuum housing that surrounds the one-region analyzer cell;
forming ions of at least a portion of the particles;
orbiting the ions in the region of detection within the analyzer cell;
detecting those ions with predetermined charge to mass ratios; and
controlling the loss of sample from the enclosure that forms a part of the one-region analyzer cell to optimize detection of sample ions.

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**4,315,150**

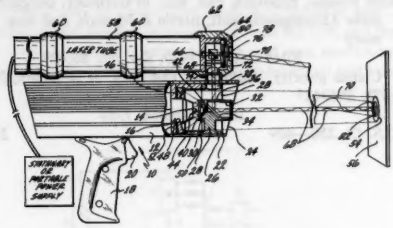
## TARGETED INFRARED THERMOMETER

**Richard E. Darringer, Fullerton; Wayne L. Scharf, Silverado, and James S. Haggerty, Mission Viejo, all of Calif., assignors to Telatemp Corporation, Fullerton, Calif.**

**Filed Jul. 24, 1980, Ser. No. 171,967**
**Int. Cl.³ G01J 1/00**
**U.S. Cl. 250—338** **9 Claims**

1. An apparatus for determining temperature by measuring infrared radiation, said apparatus including an infrared radiation detector and a reflector structure for directing radiation given off at a specific area in front of and remote from said apparatus to said detector, said reflector structure including a primary reflector and a secondary reflector, said primary reflector being shaped and located so as to reflect radiation given off at said area toward said secondary reflector, said secondary reflector being shaped and located so that radiation reflected toward it by said primary reflector is reflected by it to said infrared radiation detector, said reflector structure having an optical axis, in which the improvement comprises:

a collimated light source means mounted on said apparatus,
beam splitting means for splitting light emitted by said light source means into two separate beams,
a mirror positioned on said apparatus adjacent to said reflector structure so as to intercept a first of said separate beams and reflect it along said optical axis of said reflector structure,



beam directing means positioned on said apparatus so as to intercept the other of said separate beams and to direct said other of said separate beams so that it crosses the first of said separate beams at a point remote from said apparatus.

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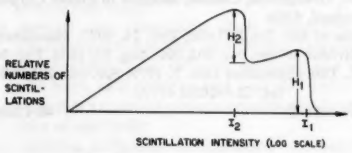
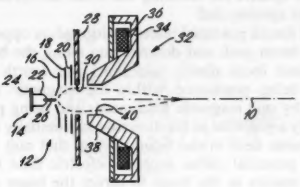
**4,315,151**
**DETECTING PHASE SEPARATION IN LIQUID SCINTILLATION SAMPLES**
**Donald L. Horrocks, Placentia, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.**
**Filed Jul. 7, 1980, Ser. No. 166,520**
**Int. Cl.³ G01T *1/20***
**U.S. Cl. 250—362** **8 Claims**




1. A method of determining whether a liquid scintillation sample is separated into different phases, comprising the steps of:
irradiating the sample with gamma rays from a radiation source to produce energetic electrons in the sample by Compton scattering and thereby cause the sample to emit successive scintillations, each scintillation being caused by a transfer of energy from one of the Compton-scattered electrons and having an intensity corresponding to the amount of energy so transferred;
measuring the relative numbers of scintillations emitted in response to the gamma rays having intensities distributed within each of a plurality of ranges of intensities; and
determining from said distribution of intensities whether the sample is separated into different phases.

**4,315,152**
**ELECTRON BEAM APPARATUS**
**Kenneth C. A. Smith, Cambridge, England, assignor to National Research Development Corporation, London, England**
**Continuation of Ser. No. 888,991, Mar. 22, 1978, abandoned.**
**This application Oct. 3, 1979, Ser. No. 81,554**
**Claims priority, application United Kingdom, Mar. 23, 1977, 12175/77**
**Int. Cl.³ H01J *37/00***
**U.S. Cl. 250—396 ML** **12 Claims**



1. Electron beam apparatus comprising:
vacuum enclosure means for the electron beam;
an electron gun including cathode means of small emitting area for producing an electron beam along a predetermined axis; and
single pole magnetic lens means including a pole-piece having a generally conical nose portion which extends from the pole-piece along said axis towards said emitting area,
said lens means being so disposed as to cause said emitting area to be exposed to an axially symmetric magnetic field extending from said nose and operative on said beam immediately on emergence from said emitting area, such that said beam is focused at a desired position on said axis, the cathode and the nose of the pole-piece being disposed on the same side of the radial plane containing the desired position.

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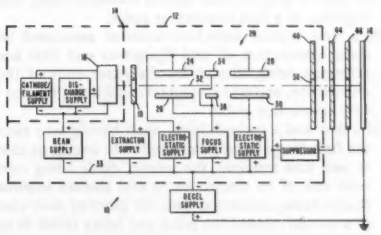
**4,315,153**
**FOCUSING EXB MASS SEPARATOR FOR SPACE-CHARGE DOMINATED ION BEAMS**
**Richard P. Vahrenkamp, Newbury Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.**
**Filed May 19, 1980, Ser. No. 151,009**
**Int. Cl.³ G21K *1/08*; B01D *59/44***
**U.S. Cl. 250—396 R** **10 Claims**




1. An ExB mass separator comprising:
means for providing a charged particle beam so that selected species in the beam pass along a beam path through said ExB mass separator;
means for applying a magnetic field along the beam path within said separator in a direction substantially normal to the path of particles in the beam;
first and second potential plates within the magnetic field and positioned on opposite sides of the beam path, means

for applying potential to said first and second potential plates so that particles of the selected species within the beam move along a preselected beam path between said first and second potential plates;

first and second focus plates respectively positioned on opposite sides of the beam path and positioned within the magnetic field provided by said magnetic field means, said focus plates being positioned downstream along the beam path from said potential plates;

means for applying focus potential to both of said focus plates for applying focus force to the selected charged particle species for focusing the beam comprised of that selected species; and

third and fourth potential plates positioned on opposite sides of the beam path and downstream along the beam path from said focus plates, said third and fourth potential plates being positioned within the magnetic field produced by said magnetic field means and being positioned to apply a potential in the direction substantially normal to a magnetic field in the beam path so that said third and fourth potential plates apply an electric field to the selected species in the beam to direct the beam along the preselected path in the magnetic field.

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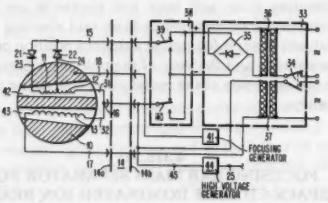
## 4,315,154
## MULTIPLE FOCUS X-RAY GENERATOR

**Walter Weigl, Edison; Ulf Bergman, Iselin; Lennart Baum, Edison, all of N.J., and Herbert Schnitger, Erlangen, Fed. Rep. of Germany, assignors to Siemens Corporation, Iselin, N.J.**

**Filed Nov. 8, 1979, Ser. No. 92,360**
**Int. Cl.³ H05G *1/00***
**U.S. Cl. 250—402** **8 Claims**




1. A multiple focus X-ray generator comprising, in combination:

(a) an electron source having at least a first and a second cathode filament of different size, which may include different thickness, winding distances, or lengths, one end of each of said first and second filaments being connected together to a first connection point;

(b) a first, second and third terminal associated with the serial connection of said filaments, said first and third terminals being formed by the outer ends of the serial connection, and said second terminal being formed by said first connection point;

(c) a first and a second diode, each having two electrodes, the first diode being connected with one of its electrodes to said first terminal, the second diode being connected with one of its electrodes to said second terminal, said diodes being connected with the other of their electrodes to a second connection point and being poled in opposite directions;

(d) means for supplying direct current, said d-c supply means having two poles, one of said poles being adapted to be connected to said second connection point of said diodes and the other of said poles being adapted to be connected to said third terminal, and said d-c supply means including switching means for changing the polarity of the d-c voltage between said two poles; and

(e) a cable containing at least a first and a second connection line, wherein said first connection line is arranged between said one pole of said d-c supply means and said second connection point, and wherein said second connection line is arranged between said other pole of said d-c supply means and said third terminal.

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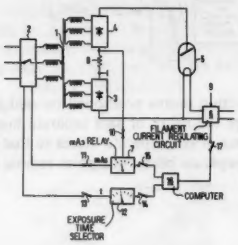
## 4,315,155
## X-RAY DIAGNOSTIC GENERATOR WITH A MAS-RELAY

**Kurt Franke, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Oct. 17, 1979, Ser. No. 85,699**
**Claims priority, application Fed. Rep. of Germany, Nov. 14, 1978, 2849427**
**Int. Cl.³ H05G *1/34***
**U.S. Cl. 250—409** **2 Claims**




1. An x-ray diagnostic generator for x-ray exposures comprising a mAs relay, exposure time selector means for selecting the exposure time, and a computer which determines the x-ray tube current, said exposure time selector means being operable to freely select any of a series of exposure time values given fixed values set for the x-ray tube voltage and the mAs product, means for connecting said exposure time selector and said mAs relay with said computer and providing for the control of x-ray tube current by said computer in accordance with the values of exposure time and mAs product selected at said exposure time selector means and at said mAs relay, and means for terminating an exposure in accordance with the value of exposure time selected at said exposure time selector means.

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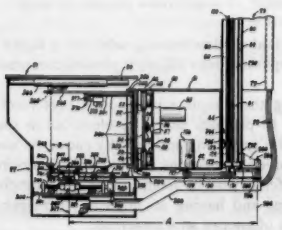
## 4,315,156
## X-RAY APPARATUS

**Leslie J. Sell, Orangeville, Canada, assignor to Picker Corporation, Cleveland, Ohio**

**Continuation of Ser. No. 837,848, Dec. 24, 1977, abandoned, which is a division of Ser. No. 603,264, Aug. 11, 1975, Pat. No. 4,082,955. This application Dec. 7, 1979, Ser. No. 101,088**
**Int. Cl.³ G03B *41/16***
**U.S. Cl. 250—445 T** **40 Claims**



1. In a tomographic X-ray table including a base, an x-ray source and an imaging assembly the improved tomographic drive system comprising:

(a) a movably supported carriage positioned within the base;

(b) an extensible proportioning arm movably connected to said carriage for rotation about an axis within the base;
(c) the arm having opposite end regions adapted to be connected to a tower structure and another structure for driving the structures through coordinated movements to produce a tomograph, the structures being constrained for movement along parallel paths;
(d) said carriage being movable substantially rectilinearly within the base to control the location of the axis; and,
(e) sliding guide means interposed between the arm and the carriage to permit relative carriage and arm movement longitudinally of the arm as the arm rotates about said axis.

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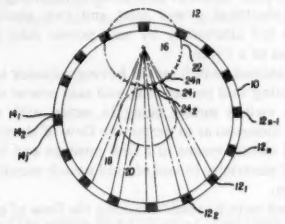
**4,315,157**

## MULTIPLE BEAM COMPUTED TOMOGRAPHY (CT) SCANNER

**Gary T. Barnes, Birmingham, Ala., assignor to The University of Alabama in Birmingham, Birmingham, Ala.**

**Filed May 1, 1980, Ser. No. 145,820**
**Int. Cl.³ A61B *6/00***
**U.S. Cl. 250—445 T** **11 Claims**



1. A multiple beam computed tomography (CT) scanner for constructing an image of a cross-sectional slice of the body of a patient, comprising:
source means for projecting a fan-shaped beam of X-ray radiation from a focal spot towards said body;
means for rotating said source means in a first direction around said body;
a detector ring comprising plural interspaced groups of closely spaced detectors, each having a detector aperture for receiving X-ray radiation, arranged in a ring around said body, said detector ring and said source means arranged in a common plane intersecting said cross-sectional slice of said body;
a radiation collimator having plural collimator apertures rotatably mounted between said source means and said patient body; and
means for rotating said collimator in a second direction opposite said first direction in synchronism with the rotation of said source means such that the collimator apertures maintain alignment with respective detector groups during rotation of said source means,
wherein the synchronous rotation of said source through an angle $\theta$ and said collimator through an angle $\phi$ relative to said source is governed by the transcendental equation,

$$R\sin(\theta-\phi)=r\sin\phi$$

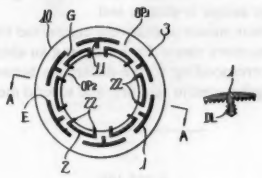
wherein r and R are the radii of circles defined by the locus of the source means focal spot and the detector ring, respectively.

**4,315,158**

## PHOTOELECTRIC SMOKE SENSING CHAMBER AND SMOKE SENSOR BOX

**Yasugi Kakigi, and Takao Kakigi, both of Tokyo, Japan, assignors to Cybernet Electronics Corporation, Kanagawa, Japan**

**Division of Ser. No. 943,620, Sep. 19, 1978, Pat. No. 4,249,082. This application Oct. 9, 1979, Ser. No. 82,474**
**Claims priority, application Japan, Sep. 20, 1977, 52-126611; Oct. 17, 1977, 52-138824**
**Int. Cl.³ G01N *15/06***
**U.S. Cl. 250—574** **1 Claim**



1. A photoelectric smoke sensing chamber in a smoke sensing blind box which comprises a cylindrical body having inner and outer walls with vertical openings with both ends of the cylindrical body closed, said chamber being characterized by inner and outer shell members which constitute the inner and outer walls fixed into an annular base and upwardly extended to the ceiling of the cylindrical body; a support for a luminous element and a light receiving element, which support is sealingly fitted into the inner edge of said annular base; light shading projections radially extended from at least one portion of the inner surface in full length of each of said inner and outer shell members; and a scattered light weakening layer formed at least on the inner surface of the cylindrical body for weakening scattered light occurring due to the reflection of the beam from said luminous element.

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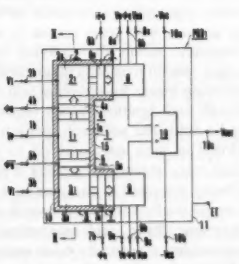
**4,315,159**

## OPTICAL SENSOR DEVICE WITH REDUCTION OF AMBIENT LIGHT EFFECTS

**Yukichi Niwa; Mitsutoshi Owada, both of Yokohama; Noriyuki Asano, Kawasaki; Masahiko Ogawa, Hino, and Shuichi Tamura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed May 22, 1979, Ser. No. 41,503**
**Claims priority, application Japan, May 25, 1978, 53-63049**
**Int. Cl.³ H01J *40/14***
**U.S. Cl. 250—578** **9 Claims**



1. An apparatus for processing a light signal intermittently incident on an image sensor which produces an electric charge, comprising:
(a) first memory means operatively connected to the image sensor for storing a quantity of the electric charges produced by the image sensor;

(b) second memory means operatively connected to the image sensor for storing a quantity of the electric charges produced by the image sensor;

(c) first control gate means connected between the image sensor and the first memory means for permitting transfer of said electric charge to the first memory means during a certain interval when the light signal incident on the image sensor is present;

(d) second control gate means connected between the image sensor and the second memory means for permitting transfer of said electric charge to the second memory means during a certain interval when the light signal incident on the image sensor is absent; and

(e) comparison means operatively connected to the first and second memory means for producing an electrical output signal corresponding to the difference between the electric charges stored in said first and second memory means.

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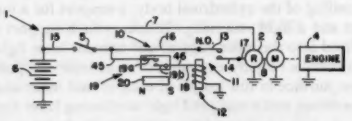
**4,315,160**

## ANTI-THEFT CONTROL AND METHOD

**Marc A. Levine, 17096 Chillicothe Rd., Chagrin Falls, Ohio 44022**

**Filed Aug. 22, 1979, Ser. No. 68,617**
**Int. Cl.³ B60R** *25/00*
**U.S. Cl. 307—10 AT** **10 Claims**



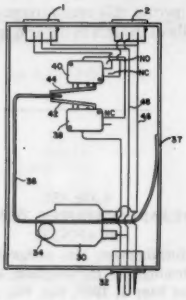

1. A secretive power controller for a vehicle or the like having controllable starter means for starting the vehicle source of mechanical power, such starter means including a starter motor means energizable for starting the source of mechanical power, a source of electrical power, and an ignition switch, said ignition switch having an ignition off position for stopping the source of mechanical power, an ignition on position for permitting operation of the source of mechanical power after starting thereof, and a start position for permitting energization of such starter motor, comprising a relay means for controlling energization of such starter means, remotely operable magnetically responsive switch means for controlling energization of said relay means, said switch means being readily hideable in such vehicle or the like and being responsive to an externally applied magnetic force for operating said switch means to activate said relay means to energize such starter means, magnetic means for applying such magnetic force from a location spaced from said magnetically responsive switch means, coupling means for coupling said relay means to such source through such ignition switch requiring that both said relay means be activated and such ignition switch at the same time be closed in such start position to energize such starter motor, said relay means comprising a normally open relay capable of being activated to energize such starter means only while said magnetically responsive switch means is operated by such magnetic force, said magnetically responsive switch means comprising a normally open switch capable of being operated to closure only while such magnetic force is applied to said magnetically responsive switch means, and said coupling means, said magnetically responsive switch means, and such ignition switch means being cooperably related to require that said relay means will be in its activated state only while both such ignition switch means is closed in its start position and said magnetically responsive switch means is operated by such a magnetic force.

**4,315,161**

## ELECTRIC POWER SHARING DEVICE

**Kenneth A. Bailey, Box 1418, Claresholm, Alberta, Canada**

**Continuation of Ser. No. 943,756, Sep. 19, 1978, abandoned. This application Jun. 17, 1980, Ser. No. 160,323**
**Claims priority, application United Kingdom, Sep. 19, 1977, 38885/77**
**Int. Cl.³ H02J** *3/00;* **H01H** *3/26, 37/20*
**U.S. Cl. 307—31** **4 Claims**




1. A timed electrical power sharing device for distributing electric power to either of two loads comprising:

a single electrical power inlet and two electrical power outlets fed alternately by said power inlet for variable portions of a cycle,

first and second switch means having actuator elements and connecting said power inlet and said power outlets,

said first switch means being in series with said second switch means so as to permit the flow of electricity to said second switch means in a first position and interrupt the flow of electricity to said second switch means in a second position,

said second switch means directing the flow of electricity to one of said outlets when in a first position and the other of said outlets when in a second position,

said first and second switch means being positioned in opposed relationship,

a common actuator member for said first and second switch means actuator element comprising a thermally responsive bimetallic arm positioned between said first and second switch means and engageable with said actuator elements,

a continuously rotating cam engaging said bimetallic arm for changing the position of said bimetallic arm relative to said actuator elements during said variable portions of a cycle,

whereby the ambient temperature determines the configuration of said arm member and thereby determines the proportional actuation of said first and second switch means for diversion of power to said power outlets during a cycle of said cam as a function of the ambient temperature.

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**4,315,162**

## RESERVE POWER SUPPLY FOR COMPUTERS

**Frank T. Ferguson, Oklahoma City, Okla., assignor to Control Technology, Incorporated, Oklahoma City, Okla.**

**Filed May 9, 1980, Ser. No. 148,091**
**Int. Cl.³ H02J** *7/00, 9/00*
**U.S. Cl. 307—66** **23 Claims**

1. A power supply comprising:

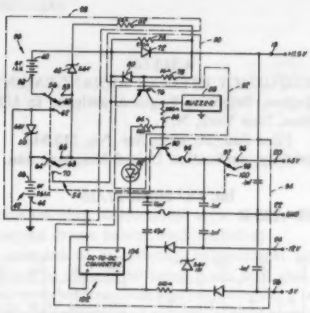
a first source of electrical energy;

a second source of electrical energy;

switch means for connecting said first source in electrical series with said second source when said switch means is in a first selectable state and for connecting said first

source in electrical parallel with said second source when said switch means is in a second selectable state; and

coupling means for coupling said first and second sources to a first output of a primary power supply so that said sources provide electrical power to a load connected to the primary power supply when said sources are connected in series and the voltage at the first output of said primary power supply is a predetermined amount below a first voltage output of said serially connected first and second sources and so that the primary power supply provides a charging current to said first and second sources when said sources are connected in electrical parallel.



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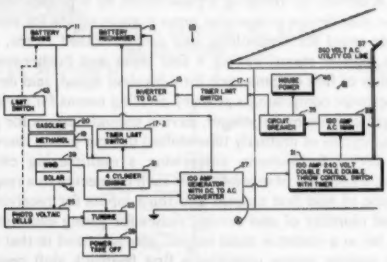
## 4,315,163

## MULTIPOWER ELECTRICAL SYSTEM FOR SUPPLYING ELECTRICAL ENERGY TO A HOUSE OR THE LIKE

**Frank Bienville, 6140 Rio Linda Blvd., Rio Linda, Calif. 95673**

**Filed Sep. 16, 1980, Ser. No. 187,810**
**Int. Cl.³ H02J *9/04***
**U.S. Cl. 307—66** **11 Claims**



1. A system for supplying electrical energy to a 100 AMP main connected to a house comprising:

(a) a utility company power line

(b) a 100 AMP dynamotor

(c) a battery system for supplying energy to the 100 AMP dynamotor

(d) an AC generator for generating energy for charging the battery system, and

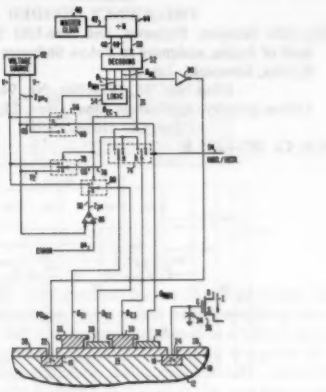
(e) a switch system coupled to said 100 AMP main, said utility company power line and said 100 AMP dynamotor.

## 4,315,164

## BIDIRECTIONAL CHARGE CONTROL CIRCUIT

**Francis J. Kub, Pasadena; Marvin H. White, Columbia; Ingham A. G. Mack, Laurel, and Donald R. Lampe, Ellicott City, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Apr. 8, 1980, Ser. No. 139,376**
**Int. Cl.³ G11C *19/28*; H01L *29/78***
**U.S. Cl. 307—221 D** **14 Claims**



1. A bidirectional charge control circuit for incrementing and decrementing metered amounts of charge on a charge storage medium, said circuit comprising:

a semiconductor substrate body doped with a first impurity type and having a predefined charge transfer channel therein;

a first semiconductor region, doped with a second impurity type, disposed at one end of said predefined channel and located at the surface of said substrate body, said charge storage medium being coupled to another end of said predefined charge transfer channel, opposite said one end in the direction of charge transfer;

a gate dielectric lying on top of said semiconductor substrate body at least covering said predefined charge transfer channel surface area;

first, second, third and fourth gate electrodes disposed on said gate dielectric layer, adjacently aligned, respectively, in a direction from said first doped region to said charge storage medium across said predefined channel area, said gate electrodes being substantially isolated from each other, said first doped region, and said charge storage medium;

a first electrical signal coupled electrically to said first doped semiconductor region and operative to provide charge thereto in accordance with a first timing sequence;

a first electrical circuit for generating second and third electrical signals having varying potentials respectively corresponding to second and third timing sequences;

an electrical switch selectively operative in a first state to couple said second and third electrical signals to said first and third gate electrodes, respectively, for incrementing charge and in a second state to couple said second and third electrical signals to said third and first gate electrodes, respectively, for decrementing charge;

a fourth electrical signal coupled electrically to said second gate electrode and having at times a governing potential, commensurate with said metered amounts of charge associated with said incrementing and decrementing operations; and

a second electrical circuit for generating a fifth electrical signal having a potential varying in accordance with a fourth timing sequence, said fifth electrical signal being

coupled to said fourth gate electrode, whereby metered amounts of charge may be incremented and decremented, selectively, to and from the charge storage medium, respectively, in accordance with the time varying potential sequences of the first through the fifth generated electrical signals and the selective operations of the electrical switch.

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**4,315,165**

## FREQUENCY DIVIDER

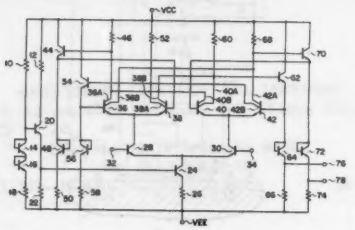
**Shyoichi Shimizu, Fujisawa, and Ken-Ichi Torii, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Nov. 16, 1979, Ser. No. 94,987**

**Claims priority, application Japan, Nov. 21, 1978, 53/143877**

**Int. Cl.³ H03K *23/08***

**U.S. Cl. 307—225 R** **8 Claims**



1. A frequency divider comprising:

a first flip-flop circuit including a first double collector transistor and a second double collector transistor having its first collector connected to the base of said first double collector transistor, its emitter connected to the emitter of said first double collector transistor and its base connected to a first collector of said first double collector transistor;

a second flip-flop circuit including a third double collector transistor having its first collector connected to a second collector of said second double collector transistor and its second collector connected to the first collector of said first double collector transistor and a fourth double collector transistor having its first collector connected to a second collector of the first double collector transistor and to the base of said third double collector transistor, its second collector connected to the first collector of said second double collector transistor, its base connected to the first collector of said third double collector transistor and its emitter connected to the emitter of said third double collector transistor;

input means for selectively energizing one of said first and second flip-flop circuits in response to an input signal; and

output means coupled to the first collectors of transistors in any one of said first and second flip-flop circuits;

wherein each of said first through fourth double collector transistors comprises

a semiconductor substrate of a first conductivity type,

a first semiconductor region of a second conductivity type formed in the surface area of said substrate,

two buried layers of the second conductivity type formed between said substrate and first semiconductor region and having an impurity higher than the impurity of said first semiconductor region and, the portion of said buried layers reaching the surface of said first semiconductor region and said buried layers acting as first and second collectors,

a second semiconductor region of the first conductivity type formed in the surface area of said first semiconductor region, said second semiconductor region acting as the base, and

a third semiconductor region of the second conductivity type formed in the surface area of said second semiconductor region, said third semiconductor region acting as the emitter.

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**4,315,166**

## FREQUENCY DIVIDER ARRANGEMENT

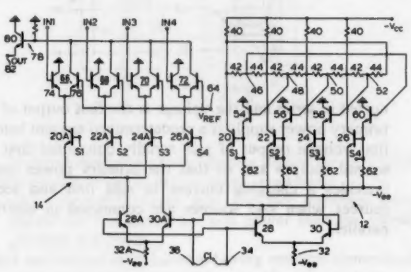
**John B. Hughes, Brighton, England, assignor to U.S. Philips Corporation, New York, N.Y.**

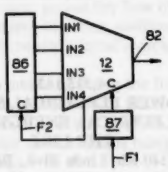
**Filed Jan. 21, 1980, Ser. No. 113,843**

**Claims priority, application United Kingdom, Jan. 31, 1979, 03449/79**

**Int. Cl.³ H03K *21/36***

**U.S. Cl. 307—225 R** **4 Claims**



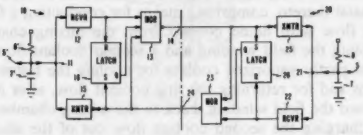


1. A device for dividing a pulse series by a predetermined factor, said device comprising input register means for storing a code word for controlling said predetermined factor, said input register means having a first input and furthermore a plurality of first outputs each for a bivalent signal, said device furthermore comprising a primary dividing means for dividing said pulse series by an integer, having second outputs for producing cycles of mutually time-shifted driving pulses thereon, said device furthermore comprising a multiplexing circuit having a plurality of second inputs each connected to a respective one of said first outputs and third inputs for receiving a second plurality of said driving pulses for gating each time a code bit to a common third output, characterized in that said input register means comprise a first feedback shift register having a clock input and in that said primary dividing means comprise a cycle of $2n+2(n=1,2,\ldots)$ semiconductor devices in an integrated circuit, said devices being cyclically interconnected for controlling a first succession thereof within said cycle to a conducting state and a second succession within said cycle to a non-conducting state and for controlling each time a mutually opposite pair of transitions of two of said semiconductor devices between said first and second successions as determined by a switching delay of at least one such semiconductor device for driving said first and second successions in steady progress along said cycle.

## 4,315,167
## SELF-SWITCHING BIDIRECTIONAL DIGITAL LINE DRIVER

Rafael Pelc, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 10, 1979, Ser. No. 73,590
Int. Cl.[3] H03K *17/56, 3/01*
U.S. Cl. 307—241 5 Claims




1. A self-switching bidirectional logic driver, comprising a pair of coupled driver halves, each including:

a gate coupled to an external bidirectional input/output node and to an internal input node, said gate having an output coupled to an internal output node;

a latch having a first input coupled to said external bidirectional input/output node and a second input coupled to said internal input node, said latch having an output coupled to said gate; and

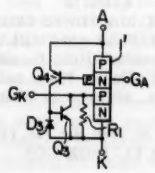
a transmitter coupled to said external node and to said internal input node, said transmitter being adapted to drive said external node to a first logic level and to release said external node toward a second logic level,

said pair of driver halves being coupled to each other by connecting the internal input node of each of said driver halves to the internal output node of the other of said driver halves.

## 4,315,168
## SEMICONDUCTOR SWITCH

Ichiro Ohhinata, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 5, 1979, Ser. No. 82,026
Int. Cl.[3] H03K *17/72*
U.S. Cl. 307—252 G 7 Claims

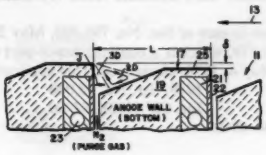



1. A semiconductor switch comprising a PNPN switch, first and second transistors and a level shift element, wherein one outermost PN junction of said PNPN switch is shortcircuited by said first transistor, the emitter-base junction of said second transistor and said level shift element are connected in series, the series circuit is connected in parallel with the other outermost PN junction, and the collector of said second transistor is connected to the base of said first transistor.

## 4,315,169
## STAIRCASE ELECTRODE-WALL CONFIGURATION FOR MHD GENERATORS

Oscar Biblarz, Carmel, Calif., assignor to The United States of America as represented by the Scretary of the Navy, Washington, D.C.

Filed Nov. 8, 1979, Ser. No. 92,298
Int. Cl.[3] H02K *45/00*
U.S. Cl. 310—11 9 Claims

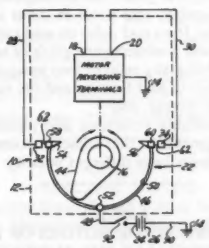



1. An electrode configuration for an MHD generator in which a hot plasma flows along a duct having opposing electrode walls, said hot plasma being subjected to a strong magnetic field, comprising a plurality of periodic electrode elements forming said electrode walls, each of said electrode elements being in the form of a backward-facing step having an insulator portion and an electrode portion, said electrode portion being situated so as not to be directly exposed to said hot plasma and so as to have the electric field generated coact with said magnetic field to essentially balance the convection force at the exposed surface of said electrode portion, and each of successive ones of said electrode elements along the axis of said hot plasma flow being offset to form a steplike divergence for said duct.

## 4,315,170
## REVERSIBLE ELECTRIC MOTOR

Silas Penn, 5316 Sheridan, Detroit, Mich. 48213

Filed Jul. 7, 1980, Ser. No. 166,494
Int. Cl.[3] H02K *33/10*
U.S. Cl. 310—39 3 Claims



1. An electric motor having a rotatably oscillating output shaft, said motor comprising a pair of reversing terminals, a reversing switching mechanism for connecting the first of said reversing terminals to an output terminal of a source of electric power while disconnecting the second of said reversing terminals from said output terminal and for connecting the second of said reversing terminals to said output terminal while disconnecting the first of said reversing terminals from said output terminal, a cam on the output shaft for operating said switching mechanism, and abutments limiting the rotation of said output shaft in one direction and in the other, wherein each of said reversing terminals is connected to one of a pair of stationary

electrical contacts, said reversing switching mechanism comprises a movable contact operable by said cam into engagement with one of said stationary contacts while being disengaged from the other of said stationary contacts and said movable contact comprises a spring bias detent for maintaining said movable contact and one of said pair of stationary contacts in engagement until disengaged by said cam.

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**4,315,171**

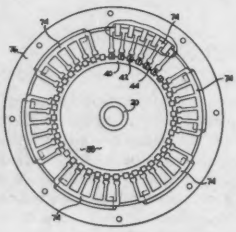
## STEP MOTORS

**Ernest Schaeffer, 6234 Kentland Ave., Woodland Hills, Calif. 91367**

**Continuation-in-part of Ser. No. 799,302, May 23, 1977, Pat. No. 4,190,779, which is a continuation-in-part of Ser. No. 683,180, May 4, 1976, abandoned. This application Nov. 16, 1979, Ser. No. 95,068**

**Int. Cl.³ H02K *37/00***

**U.S. Cl. 310—49 R** **26 Claims**



1. A motor for encouraging relative motion between a rotor assembly and a stator assembly comprising:

a rotor assembly presenting at a rotor surface a plurality of rotor poles equally spaced at a predetermined pitch, each said pole having the opposite polarity of the immediately adjacent rotor poles;

a stator assembly having a plurality of individual stator segments, each of said segments presenting a plurality of poles forming a pole group adjacent said rotor surface, each of said pole groups having at least three poles having the same pitch as said poles on said rotor assembly, said stator segments being staggered adjacent said surface of said rotor so that when said poles in at least one of said stator segments is aligned with the adjacent said poles of said rotor assembly, said poles in other said stator segments are offset from said poles on said rotor assembly by a fraction of said predetermined pitch of said rotor poles, said fraction being any ratio of two unequal integers such that the product of said fraction and the number of stator segments is an integer; and

means for controllably polarizing said plurality of poles in said stator segments so that adjacent poles in the respective said segments have different polarity.

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**4,315,172**

## COOLING SYSTEM FOR ROTORS OF ELECTRIC MACHINES, ESPECIALLY FOR TURBO-GENERATOR ROTORS WITH A SUPERCONDUCTIVE FIELD WINDING

**Lutz Intichar, Erlangen, and Erich Weghaupt, Mülheim, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany**

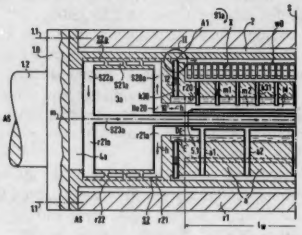
**Filed Dec. 12, 1979, Ser. No. 102,647**

**Claims priority, application Fed. Rep. of Germany, Dec. 14, 1978, 2854059**

**Int. Cl.³ H02K *9/00***

**U.S. Cl. 310—53** **11 Claims**

1. Cooling system for a rotor of an electric machine having a superconductive field winding and formed of a rotor drum with at least one outer, substantially hollow cylindrical rotor body with a co-rotating cold shield, an inner hollow rotor body fastened at given locations within the outer rotor body so as to be thermally insulated and serving as a coil-winding support, the fastening locations at the outer rotor body being cooled, and a co-rotating mixing chamber located at the inner periphery of the inner hollow rotor body and containing a phase mixture of a coolant fed thereto from the outside, the phase mixture forming, during rotation of the rotor, a radially outwardly flung liquid-ring and a radially inner vapor column coaxial thereto, comprising means for conducting a first coolant flow with liquid coolant from the mixing chamber for cooling the field winding and a second coolant flow with at least partly vaporized coolant for cooling the fastening locations and for returning the first coolant flow, after it has traversed the field winding, back to the mixing chamber and for discharging the second coolant flow out of the electric machine, said means comprising (a) a network of distributor



channels disposed at the outer periphery of the field winding beyond a radially outermost coil base of the field windings, (b) said distributor channel network being formed of substantially axially and tangentially extending distributor channels, (c) substantially radial cooling channels extending along lateral surfaces of respective stacks of coil conductors of the field windings and connected to said distributor channel network, (d) radially extending feed channels connected, at one end thereof, to said network of distributor channels at locations beyond the axial range of the field winding and, at the other end thereof, terminating at inlet locations to the mixing chamber at a space therein in which the liquid ring is formed, and (e) return feed channels connected, at one end thereof, to said radial cooling channels of the field winding and terminating, at the other end thereof, in the mixing chamber, (f) the terminations of said return feed channels being at locations which are, at most, at the same distance radially from the rotor axis as are said inlet locations to the mixing chamber.

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**4,315,173**

## DYNAMOELECTRIC MACHINES SEGMENTAL AIR GAP BAFFLE ASSEMBLY

**Raymond M. Calfo, Braddock Hills; Gerald R. Alkire, New Alexandria; George F. Dailey, Plum, and Arthur Mulach, Penn Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Mar. 30, 1980, Ser. No. 135,552**

**Int. Cl.³ H02K *9/00***

**U.S. Cl. 310—53** **7 Claims**

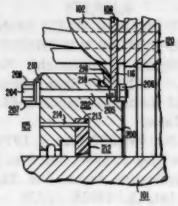
1. A dynamoelectric machine with a baffle assembly, comprising:

(a) a generally tubular shaped stator assembly including a laminated core, a stator winding disposed within said core, and a non-magnetic backup plate disposed at a first end of said stator core;

(b) a generally cylindroid shaped rotor assembly axially and rotatably mounted within said stator, with an air gap space between the outer circumference of said rotor and the inner circumference of said stator;

(c) a baffle assembly mounted over said air gap at the first

end of said stator core; said baffle assembly including an annular-shaped, non-magnetic baffle ring having a plurality of bores therethrough, and a plurality of bolts receivable through said bores to secure said baffle ring to said backup plate; and



a non-magnetic insert disposed between the inner circumference of said baffle ring and the outer circumference of said rotor, said insert being connected to said baffle ring with the radially inward edge of said insert being proximate said rotor circumference. whereby said insert is used to reduce the air gap and thereby regulate for low coolant flow rates through said air gap.

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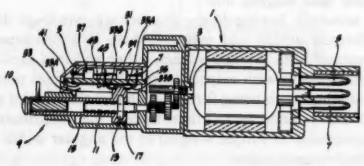
**4,315,174**

## REVERSIBLE D.C. MOTOR WITH OVER-DRIVE PREVENTION SWITCHES

**Richard D. Doerr, St. Louis, Mo., assignor to ACF Industries, Inc., New York, N.Y.**

**Filed Dec. 31, 1979, Ser. No. 108,507**
**Int. Cl.³ H02K *11/00***
**U.S. Cl. 310—68 B** **4 Claims**



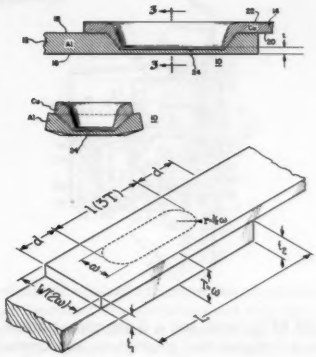
1. In a reversible d.c. motor for adjusting the position to which a carburetor throttle valve closes, the throttle valve being mounted on a throttle shaft to one end of which is attached a throttle lever, the motor having an extendable and retractable member one end of which contacts the throttle lever, a rotatable shaft which rotates in one direction or the other when the motor is energized and a gear arrangement for translating rotary movement of the shaft into linear movement of the member, the improvement comprising switch means for de-energizing the motor as the member approaches either extreme of its extending or retracting movement, de-energization of the motor stopping movement of the member before the respective extreme is exceeded thereby to prevent damage to the motor, the switch means comprising first and second sets of electrical contacts, each set of contacts being normally closed with one contact in each set being carried by the member and moving relative to the other contact as the member moves, the contacts of the respective set of contacts opening as the member reaches its respective extreme extended or retracted position thereby to open an electrical circuit through which power is supplied to the motor and de-energize the motor, the switch means still permitting energization of the motor to drive the member in the opposite direction.

**4,315,175**

## ALUMINUM-TO-COPPER TRANSITION MEMBER FOR ALUMINUM WOUND MOTORS AND ALUMINUM WOUND MOTOR EQUIPPED WITH THE SAME

**William C. Hamilton, Elnora; William G. Moffatt, Ballston Lake, and Gasper Pagnotta, Rexford, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Continuation of Ser. No. 591,833, Jun. 30, 1975, abandoned. This application Apr. 24, 1980, Ser. No. 143,342**
**Int. Cl.³ H02K *3/02*; H01R *4/02, 4/20, 4/62***
**U.S. Cl. 310—71** **14 Claims**



1. An electrical transition member consisting of:

a single longitudinally-extending copper conductor and a single longitudinally-extending aluminum conductor in overlapping relationship, the cross-sectional areas of said conductors being so related in size as to provide closely matched electrical current carrying capacities,

said conductors being joined together by a single cold weld joint in which a portion of said copper conductor has been displaced into said aluminum conductor resulting in a cup-shaped configuration having an inside surface of copper and being of generally rectangular shape,

said cup-shaped configuration having an inside width approximately equal to the total of the thicknesses of said conductors and an inside length approximately equal to three times said total of conductor thicknesses,

the thickness of the base of said cup-shaped configuration being in the range of from 18 to 26 percent of said total of conductor thicknesses, and

said cold weld joint as formed, and the material of said conductors in the vicinity thereof, being substantially free of copper-aluminum intermetallic compounds and voids.

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**4,315,176**

## ELECTRIC MOTOR

**Masaaki Sendo, and Kinzo Suzuki, both of Nakatsugawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 30, 1979, Ser. No. 62,242**
**Claims priority, application Japan, Jan. 25, 1978, 53-7420**
**Int. Cl.³ H02K *7/10***
**U.S. Cl. 310—83** **8 Claims**

1. An electric motor device comprising:

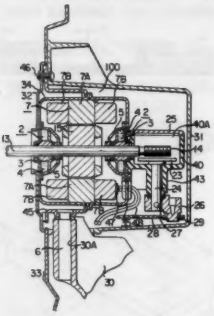
cup-shaped housing means having a first shaft bearing unit and a stator therein;

a shaft which is rotatable in said shaft bearing unit and has a rotor thereon rotatable within the stator;

a cup-shaped bracket member opening toward and fixed at the periphery thereof to said housing means and having defined in the bottom portion thereof a central hole and a plurality of fixing holes;

a second bearing unit disposed in said central hole and through which said shaft rotatably extends;

a gear box member formed of electrically insulating synthetic resin disposed on the outside of the bottom portion of said bracket member and housing the portion of the shaft extending beyond said second bearing unit, said gear box member including a gear bearing, and a fixing portion comprising a wall plate portion contacting the outside of said bottom portion of the bracket member, protrusions integral with and extending from said wall plate portion



into said fixing hole, and a fixing plate portion integral with and bridging said protrusions and contacting the inside of said bottom portion of the bracket member, said wall plate portion and said fixing plate portion thereby sandwiching said bottom portion of the bracket member therebetween;

a first gear rigidly fixed to the end portion of said shaft within said gear box; and

a second gear rotatably supported by said gear bearing and engaging with said first gear.

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**4,315,177**

**DIRECT CURRENT MOTOR WITH NON-SUPERPOSED ARMATURE WINDINGS**

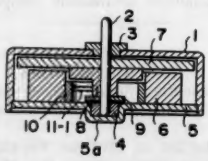
**Itsuki Ban, 829, Higashi-Oizumimachi, Nerima-ku, Tokyo; Manabu Shiraki, 4451-171, Shimotsuruma, Yamato-shi, Kanagawa-ken, and Kazuhito Egami, 2-44-1, Chuo, Nakano-ku, Tokyo, all of Japan**

**Continuation of Ser. No. 952,143, Oct. 17, 1978, abandoned. This application May 5, 1980, Ser. No. 146,753**

**Claims priority, application Japan, Jan. 23, 1978, 53-5318**

**Int. Cl.³ H02K *21/26***

**U.S. Cl. 310—154** **2 Claims**



1. A direct current motor having armature windings that are non-superposed with respect to each other comprising:

a field magnet having l(2m+2n) poles that are magnetized into alternate N and S polarities in equal angular spaces wherein l and m are positive integers of 1 or more and n is a positive integer of 2 or more;

a magnetic material member for closing the magnetic path of said field magnet; and

an armature having 2ln armature windings disposed thereon within said magnetic path in a non-superposed manner with respect to each other and in a face-to-face relationship with respect to said field magnet poles, said windings each being formed such that the angular spacing of those conductor portions thereof that contribute to the generation of torque is equal to the angular width of a field magnet pole.

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**4,315,178**

**DIRECT CURRENT MOTOR WITH NON-SUPERPOSED ARMATURE WINDINGS**

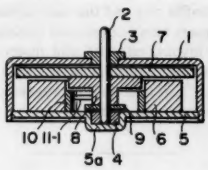
**Itsuki Ban, 829 Higashi-Oizumimachi, Nerima-ku, Tokyo; Manabu Shiraki, 4451-171 Shimotsuruma, Yamato-shi, Kanagawa-ken, and Kazuhito Egami, 2-44-1 Chuo, Nakano-ku, Tokyo, all of Japan**

**Continuation of Ser. No. 948,552, Oct. 4, 1978, abandoned. This application May 5, 1980, Ser. No. 146,754**

**Claims priority, application Japan, Jan. 23, 1978, 53-5317**

**Int. Cl.³ H02K *21/26***

**U.S. Cl. 310—154** **2 Claims**



1. A direct current motor having armature windings that are non-superposed with respect to each other comprising:

a field magnet having l(2m+2n) poles that are magnetized into alternate N and S polarities in equal angular spaces wherein l and m are positive integers of 1 or more and n is a positive integer of 2 or more;

a magnetic-material member for closing the magnetic path of said field magnet; and

an armature having l(2n−1) armature windings disposed thereon within said magnetic path in a non-superposed manner with respect to each other and in a face-to-face relationship with respect to said field magnet poles, said windings each being formed such that the angular spacing of those conductor portions thereof that contribute to the generation of torque is equal to the angular width of said field magnet poles.

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**4,315,179**

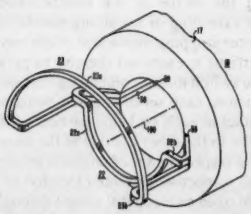
**DOUBLE LAYERED STATOR PERIPHERAL END WINDINGS**

**Kent R. Davey, College Station, Tex., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Apr. 10, 1980, Ser. No. 139,079**

**Int. Cl.³ H02K *3/00***

**U.S. Cl. 310—184** **5 Claims**



1. A dynamoelectric machine comprising: a generally tubu-

larly-shaped stator core having a plurality of slots formed in said core's inner periphery;

a plurality of coil sides each of which is partially disposed in said stator slots and partially extends into the stator's end regions, each of said stator slots having at least two of said coil sides disposed therein;

a first and second group of connector ring segments disposed in the stator's end regions for electrically joining said coil sides, the connector ring segments each having a circumferential body portion and two radial arm portions each of which is connected to one end of said body portion, the body portions of said first group having a greater radius of curvature than the body portions of said second group, said first group's connector ring segments being disposed radially outward from said second group's connector ring segments; and

said first group's connector ring segments being axially interspersed according to phase and said second group's connector ring segments being axially interspersed according to phase.

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**4,315,180**

## HIGH VOLTAGE PIEZOELECTRIC GENERATING DEVICE WITH LENGTHENED SPARK TIME

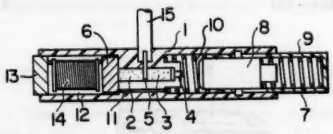
**Kaneichi Kondo, Settsu, and Yuji Shingu, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 968,516, Dec. 11, 1978, which is a continuation of Ser. No. 801,788, May 31, 1977. This application Feb. 28, 1980, Ser. No. 125,709**

**Claims priority, application Japan, Jun. 10, 1976, 51-76172[U]; Sep. 20, 1976, 51-127095[U]; Oct. 19, 1976, 51-140830[U]**

**Int. Cl.³ H01L *41/08***

**U.S. Cl. 310—319** **6 Claims**




1. A high voltage generating device for a cigarette lighter of the type generating a high voltage discharge across discharge electrodes comprising:

two piezoelectric elements;

a hammer mechanism for striking said piezoelectric elements;

an intermediate electrode provided between said two piezoelectric elements;

a pair of discharge electrodes;

a first circuit path between one end of each of said piezoelectric elements and one of said discharge electrodes;

a second circuit path between said intermediate electrode and the other of said discharge electrodes;

a coil having an inductance value between 100 mH and 1,500 mH connected in said second circuit path for applying a high voltage generated by said piezoelectric elements to said discharge electrodes through said coil to provide an extended arc period across said discharge electrode of substantially greater than 25μ seconds;

an outer housing containing said piezoelectric elements;

a coil housing joined with one side portion of said outer housing and having an outer side defining an opening opposite to said one side portion and having a bore formed at its joined portion near said intermediate electrode; and,

an insulative resin filling said opening of said coil housing to cover said coil housed therein, one end of said coil being connected through said bore to said intermediate electrode.

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**4,315,181**

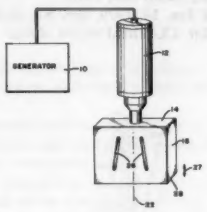
## ULTRASONIC RESONATOR (HORN) WITH SKEWED SLOTS

**Ernest P. Holze, Jr., Brewster, N.Y., assignor to Branson Ultrasonics Corporation, New Canaan, Conn.**

**Filed Apr. 22, 1980, Ser. No. 142,739**

**Int. Cl.³ H01L *41/08***

**U.S. Cl. 310—323** **5 Claims**




1. An ultrasonic resonator dimensioned to operate as a half-wavelength resonator at a predetermined frequency of sound travelling therethrough from an input surface to an oppositely disposed output surface and through a medially disposed nodal region, the improvement comprising: a pair of elongated slots disposed in said resonator and extending generally from a region near said input surface to a region near said output surface and passing through said nodal region, and said slots being angled relative to the longitudinal axis of said resonator from said input surface to said output surface to provide substantially uniform motion along said output surface of the resonator.

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**4,315,182**

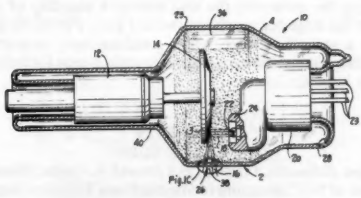
## FROSTED X-RAY TUBE

**Avery D. Furbee, Elmhurst, Ill., assignor to Picker Corporation, Cleveland, Ohio**

**Filed Sep. 1, 1977, Ser. No. 829,650**

**Int. Cl.³ H01J *35/10***

**U.S. Cl. 313—59** **13 Claims**



1. An X-ray tube comprising:

(a) an evacuated envelope formed of electrically insulating, X-ray transmissive material;

(b) a cathode assembly mounted in the envelope;

(c) an anode assembly mounted in the envelope in spaced relationship with the cathode;

(d) the anode assembly including a target area of a material which will emit a beam of X-rays along a beam path when the area is bombarded by a flow of electrons from the cathode;

(e) said envelope including an X-ray window portion along the beam path; and

(f) the tube including textured interior surfaces in envelope regions including at least portions of the window and adjacent to and between the cathode focusing element and

the anode to isolate collections of metallic particles from the assemblies into small areas which are each conductively isolated from other of such collections such that such particles do not develop a conductive layer of metal in the envelope regions whereby substantially to avoid premature tube failure due to the electrical conductivity of metal deposits.

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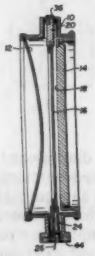
**4,315,183**

## SUPPORT STRUCTURE FOR HIGH VOLTAGE SUBSTRATE

**Elisha B. Merritt, Sunnyvale, Calif., assignor to Diagnostic Information, Inc., Sunnyvale, Calif.**

**Filed Jun. 14, 1979, Ser. No. 48,695**
**Int. Cl.³ H01J *40/06, 40/02***
**U.S. Cl. 313—94** **5 Claims**



1. In a proximity type image intensifier tube of the type having an evacuated, electrically conductive envelope, an input window, an output window, an output display screen on the output window, and a high voltage photocathode carrying substrate mounted between the input window and the output display screen, an improved structure for supporting the substrate within the envelope, and for electrically isolating the substrate from the envelope, the structure comprising a plurality of electrically insulated rods arranged in the plane of the substrate, each of the rods being connected at one end to the envelope and means for connecting the distal ends of the rods to the circumference of the substrate with the rods being oriented perpendicularly to the substrate's circumference, each of the distal rod ends having a protruding pin and wherein the connecting means comprise a ring with a rounded edge for holding the substrate, the ring having a plurality of recesses about the edge for receiving the rod pins, a cover to give the edge a smooth surface while simultaneously capturing the substrate against the ring, and removable means for holding the cover in place.

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**4,315,184**

## IMAGE TUBE

**Vincent J. Santilli, Corning, and Donald R. Quinn, Horseheads, both of N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

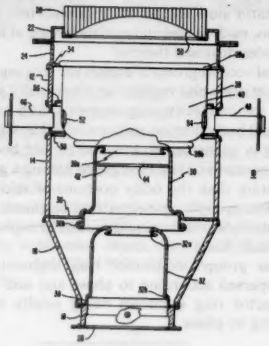
**Filed Jan. 22, 1980, Ser. No. 114,187**
**Int. Cl.³ H01J *40/00***
**U.S. Cl. 313—94** **3 Claims**

1. An improved image tube which is operable at higher voltage and consequent higher signal gain with low noise levels, which tube comprises:

(a) a plurality of generally cylindrical ceramic envelope portions which are axially aligned and sealed together to form the tube envelope with an input faceplate sealed at one end and an output target sealed at the other end;

(b) a plurality of axially aligned electrode portions disposed within the envelope including a focus electrode and an anode electrode;

the improvement wherein, the extending end portions of each of the electrodes have rolled edge portions which extend away from the cylindrical axis of the electrodes and the tube; and



wherein all electrode surfaces are coated with highly light absorptive, low secondary electron emission characteristic, insulating material to minimize electrical noise.

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**4,315,185**

## VACUUM-TIGHT, ELECTRICAL CONNECTION FOR THE PHOTOCATHODE IN AN IMAGE INTENSIFIER TUBE

**Terence C. McStravick, Leutingewolde, and Peter Sipkes, Roden, both of Netherlands, assignors to N.V. Optische Industrie "De Oude Delft", Delft, Netherlands**

**Filed Apr. 27, 1979, Ser. No. 33,985**
**Claims priority, application Netherlands, Apr. 28, 1978, 7804640**
**Int. Cl.³ H01J *40/02***
**U.S. Cl. 313—102** **5 Claims**

1. In an image intensifier tube, a structure comprising

an input window,

a photocathode on the input window,

a metallic cathode flange,

a layer of sealing material securing the input window in vacuum-tight relation to the metallic cathode flange,

an electrical conducting lead having a length passing between the window and the flange and through the layer of sealing material with one end adapted to be connected to a source of potential and with an opposite end connected to the photocathode, and

means spacing the lead from the window and the flange at at least one portion of the length of the lead so that said sealing material completely surrounds and seals the lead at the one portion,

said means including at least one cavity in the input window, which cavity is filled with the sealing material and is located between the edge of the photocathode and the outer edge of the input window and in spaced relationship to these edges so as to extend only partially along the lead length between the window and the flange, the one portion of the electrical conducting lead extending through said cavity and being embedded in the layer of sealing

material with which the input window is sealed to the cathode flange.

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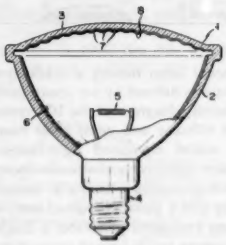
**4,315,186**

## REFLECTIVE LAMP

**Tomiyoshi Hirano; Hidehiro Shinada, both of Yokohama, and Michiyuki Sawada, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Jun. 26, 1979, Ser. No. 52,211**
**Claims priority, application Japan, Jul. 3, 1978, 53-80755**
**Int. Cl.³ H01K *1/26***
**U.S. Cl. 313—111** **7 Claims**



**1.** A reflective lamp comprising a bulb and a filament contained therein, said bulb including a front lens section and a reflective mirror section fused thereto, said front lens section consisting of glass material containing neodymium in the range of 0.5 to 5.0% by weight as calculated in terms of $Nd_2O_3$ based upon the total weight of glass material and coated on its inner surface with a first thin film reflecting infrared rays and permitting visible light to be transmitted therethrough, said reflective mirror section consisting of neodymium-free glass material and coated on its inner surface with a second thin film reflecting visible light but transmitting infra-red rays therethrough.

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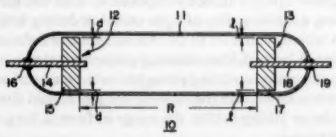
**4,315,187**

## STROBOSCOPIC DISHCHARGE TUBE FOR PHOTOGRAPHY

**Shing C. Chow, Kowloon Tong, Hong Kong, assignor to Nam Kwong Electric Co. Ltd., Tsuen Wan, Hong Kong**

**Filed Nov. 13, 1979, Ser. No. 93,942**
**Int. Cl.³ H01J *61/80, 19/70***
**U.S. Cl. 313—217** **10 Claims**



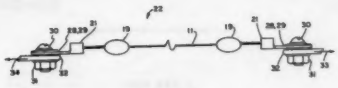
**1.** A stroboscopic discharge tube for use in photography, comprising a light-transmitting tube having its opposite ends closed, a cathode and an anode disposed within said tube, and plasma producing gas, said cathode comprising a first electric conducting stem extending through one end of the tube into the interior of the tube and a cathodic annular ring made of emissive material affixed to the stem at least by means of welding, said anode comprising a second electric conducting stem extending through the other end of the tube into the tube interior and an anodic annular ring made of impurity gas absorbing material secured to the second stem, the diameters of the cathodic and anodic rings being such that the outer peripheries of the rings are closely adjacent to the inner wall of the tube so as to define a confined discharging region between the two rings.

**4,315,188**

## WIRE ELECTRODE ASSEMBLAGE HAVING ARC SUPPRESSION MEANS AND EXTENDED FATIGUE LIFE

**Daryl D. Cerny, Greenville, Ohio, and Kurt Lining, Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.**

**Filed Feb. 19, 1980, Ser. No. 122,549**
**Int. Cl.³ H01J *1/18, 19/12***
**U.S. Cl. 313—269** **20 Claims**



**1.** An electrode assemblage comprising;

a. a wire having an end doubled back to form a loop like extremity,

b. a connector disposed within said loop,

c. clamping means carried by said connector for securing the loop to said connector, and

d. a rounded conductive mass encapsuling the wire and the terminal end of the doubled back loop.

**12.** An electrode assemblage having vibration dampening and arc suppressing means, comprising;

a. an electrode wire having a main portion and doubled back opposing end portions, each of said end portions having a terminal end of said electrode wire fixed immediately adjacent the main portion inwardly from the extremities of said electrode assemblage,

b. a connector located within each of said doubled back end portions and in electrical contact therewith, and

c. a conductive rounded mass surrounding said wire and encapsuling said terminal end for dampening vibration and reducing the electric field generated at the terminal end of a wire.

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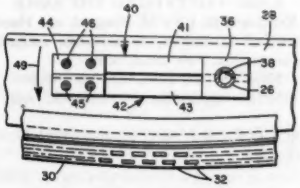
**4,315,189**

## SUPPORT STRUCTURE FOR SHADOW MASK OF COLOR CATHODE RAY TUBE

**Yasumasa Goto, and Junichi Ozaki, both of Hyogo, Japan, assignors to Toshiba Corporation, Kawasaki, Japan**

**Filed Dec. 18, 1979, Ser. No. 104,775**
**Claims priority, application Japan, Feb. 14, 1979, 54-15066; Oct. 16, 1979, 54-132417**
**Int. Cl.³ H01J *29/80***
**U.S. Cl. 313—405** **8 Claims**



**1.** A color cathode ray tube comprising:

an envelope including a panel;

a phosphor screen disposed on said panel;

a shadow mask adjacent said phosphor screen, said shadow mask including a mask frame and an apertured mask mounted across said mask frame;

a plurality of supporting members for supporting said shadow mask within said envelope, each of said supporting members having one end secured to said panel and the other end fastened to said mask frame to support said shadow mask, each of said supporting members compris-

ing a pair of plate-like segments spaced apart along at least a portion of their length and connected integrally with each other at both ends, one of said plate-like segments being formed of a metal having a higher coefficient of thermal expansion than the metal forming the other said plate-like segments, said plate-like segments being responsive to heat to bend in a direction lateral to said plate-like segments to displace said shadow mask toward said phosphor screen.

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4,315,190

## ZINC SILICATE PHOSPHOR WITH EXTENDED FLORESCENCE DECAY AND CATHODE RAY TUBE CONTAINING THE SAME

Thomas E. Peters, Chelmsford, and James R. McColl, Concord, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 15, 1980, Ser. No. 216,595
Int. Cl.[3] C09K *11/44*
U.S. Cl. 313—467 9 Claims

1. A green-emitting white-bodied cathodoluminescent manganese activated zinc silicate phosphor having a composition corresponding to the general formula:

$$2\ ZnO.v\ SiO_2.w\ MgO.x\ MnO.y\ As_2O_5.z\ M_2O$$

wherein M is an alkali metal and:

$1.0 \leqq v \leqq 2.0$

$0.01 \leqq w \leqq 0.1$

$0.001 \leqq x \leqq 0.01$

$0.00005 \leqq y \leqq 0.001$

$0.5y \leqq z \leqq 2.0y$.

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4,315,191

## LUMINESCENT MATERIAL WITH ALKALINE EARTH METAL SILICATE ALUMINATE HOST LATTICE AND LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP CONTAINING THE SAME

Willem L. Konijnendijk; Gert M. Boogerd, and Henricus L. M. Tonnaer, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 16, 1980, Ser. No. 140,899
Claims priority, application Netherlands, Apr. 20, 1979, 7903102
Int. Cl.[3] C09K *11/467, 11/463;* H01J *61/44*
U.S. Cl. 313—486 4 Claims

1. A terbium or cerium activated alkaline earth metal silicate aluminate luminescent material having a composition selected from the formulae:

$$Sr_{3-a}Ba_aSiAl_{10}O_{20}:Tb_r^{3+}$$

wherein $0 \leqq a \leqq 3.0$ and $0.10 \leqq r \leqq 0.50$ and wherein charge compensation for the terbium is achieved by substitution of Na and/or K in a Sr site and/or by Al in a Si site and;

$$Sr_{3-a-b}Ba_aCa_bSiAl_{10}O_{20}:Ce_p^{3+}$$

wherein $0 \leqq a+b \leqq 1.0$ and $0.10 \leqq p \leqq 0.50$ and wherein charge compensation for the cerium is achieved by substitution of Na and/or K in a Sr site and/or Al in a Si site.

4,315,192

## FLUORESCENT LAMP USING HIGH PERFORMANCE PHOSPHOR BLEND WHICH IS PROTECTED FROM COLOR SHIFTS BY A VERY THIN OVERCOAT OF STABLE PHOSPHOR OF SIMILAR CHROMATICITY

Henry Skwirut, Verona, and Robert G. Young, Nutley, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 31, 1979, Ser. No. 108,269
Int. Cl.[3] H01J *61/48*
U.S. Cl. 313—487 8 Claims

1. A fluorescent lamp having a predetermined correlated color temperature as defined by x-y coordinates as inscribed on the x-y chromaticity diagram of the ICI system together with combined high efficacy and good color rendition, said lamp comprising a sealed elongated light-transmitting envelope having electrodes operatively positioned therein proximate the ends thereof and enclosing a discharge-sustaining filling comprising mercury and a small charge of inert ionizable starting gas which when energized generates a discharge comprising ultraviolet radiations and a limited proportion of visible radiations, phosphor means comprising a predetermined amount of a first phosphor layer carried on the inner surface of said envelope and a predetermined amount of a second phosphor layer coated on and carried on said first phosphor layer so that said second phosphor layer is positioned nearest to said discharge:

a. said first phosphor layer principally comprising a mixture of predetermined amounts and relative proportions of narrow-band blue-emitting phosphor having an emission substantially confined to the wavelength range of from 430 nm to 485 nm, green-emitting phosphor having an emission substantially confined to the wavelength range of from 515 nm to 570 nm, and red-orange-emitting phosphor having an emission substantially confined to the wavelength range of from 588 nm to 630 nm, and the predetermined amounts and relative proportions of said mixed phosphors comprising said first phosphor layer being such that the composite emission response from said first phosphor layer when excited by said discharge falls approximately within a predetermined color ellipse on the x-y chromaticity diagram of the ICI system, portions of said green-emitting phosphor component of said first phosphor layer if directly exposed to said discharge displaying a maintenance of light emission during lamp operation which is inferior to the maintenance of light emission displayed by said blue-emitting phosphor component and said red-orange-emitting phosphor component of said first phosphor layer, and the coating weight of said first phosphor layer falling within the range of from 2.3 mg/cm$^2$ to 5.5 mg/cm$^2$;

b. said second phosphor layer principally comprising a relatively thin layer of stable finely divided phosphor means which when excited by said discharge has an emission of predetermined x-y coordinates which substantially correspond to said predetermined x-y coordinates of the composite emission of said first phosphor layer, and the coating weight of said second phosphor layer falling within the range of from 0.23 mg/cm$^2$ to 0.7 mg/cm$^2$; and

c. said composite emissions of said first phosphor layer and said second phosphor layer coupled with the limited proportion of visible radiations generated by said discharge causing the total visible emissions from said energized lamp to have predetermined x-y coordinates which fall within said predetermined color ellipse as inscribed on the x-y chromaticity diagram of the ICI system; whereby said second thin phosphor layer screens said said green-emit-

ting phosphor component from direct exposure to said discharge.

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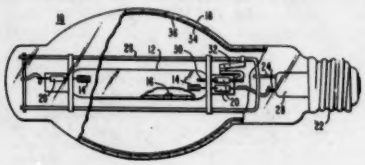
4,315,193

## HIGH-PRESSURE MERCURY-VAPOR LAMP WHICH HAS BOTH IMPROVED COLOR RENDITION AND LIGHT OUTPUT

William A. Thornton, Cranford, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 18, 1980, Ser. No. 131,305
Int. Cl.³ H01J 61/44
U.S. Cl. 313—487 4 Claims



1. A high-pressure mercury-vapor lamp having both improved lumen output and color rendering properties for illuminated objects, said lamp comprising a sealed elongated radiation-transmitting arc tube having electrodes operatively disposed therein proximate the ends thereof and enclosing a discharge-sustaining filling comprising a predetermined amount of mercury and a small charge of inert ionizable starting gas, a sealed light-transmitting protective envelope in which said arc tube is operatively mounted with the environment enclosed by said protective envelope being non-reactive for the lamp elements enclosed thereby, electrical lead-in means sealed through said arc tube and connecting to said electrodes, electrical adapter means affixed to the outer surface of said protective envelope to facilitate electrical connection to a source of electrical power, and electrical conductor means electrically connecting said electrical adaptor means to said electrical lead-in means, the radiations emitted from said arc tube when operated principally comprising a very strong green emission and a very strong yellow emission and a strong violet emission in addition to both short wavelength and long wavelength ultraviolet emissions;

finely divided phosphor means carried as a coating on the inner surface of said protective envelope, said phosphor means responsive to the ultraviolet radiations generated by said operating arc tube to provide a predetermined visible emission, said phosphor means principally comprising predetermined proportions and predetermined amounts of three different phosphor components, a first of said phosphor components being divalent-europium activated phosphor having a narrow band blue-violet visible emission peaked at about 450 nm;

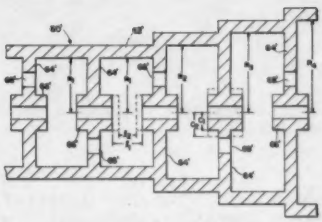
a second of said phosphor components having a narrow-band blue-green visible emission peaked in the vicinity of about 500 nm, and the third of said phosphor components being trivalent-europium-activated phosphor having a strong red emission located at about 620 nm; and the relative proportions and predetermined amounts of said three phosphor components being such that when their individual visible emissions are blended with the visible emissions from said operating arc tube, the composite emission from said lamp has a predetermined color temperature.

4,315,194

## COUPLED CAVITY TRAVELING WAVE TUBE WITH VELOCITY TAPERING

Denis J. Connolly, N. Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 20, 1980, Ser. No. 122,966
Int. Cl.³ H01J 25/34
U.S. Cl. 315—3.6 6 Claims



1. A coupled cavity traveling wave tube comprising an electron gun for producing an electron beam, a collector electrode for receiving the electrons of an electron beam produced by said electron gun, and a slow wave structure positioned between said electron gun and said collector electrode through which said electron beam and a high frequency electromagnetic wave passes, said slow wave structure comprising a plurality of serially coupled resonant cavities provided with coupling slots and ferrules the inside diameters of which serve as beam tunnels, and, excepting periodic length, ferrule inside diameter and slot length, one or more of the physical dimensions of each of the cavities from a point where loss of beam-wave synchronization begins to occur to the end of the tube adjacent to the collector being varied with respect to one another as a function of the distance from the electron gun such that the resonant frequency of each of these cavities in succession is reduced with the distance from the electron gun while the period of the slow wave structure remains unchanged and the bandwidth of the slow wave structure remains substantially unchanged, to thereby provide velocity tapering of said electromagnetic wave and resultant improved electron beam-electromagnetic wave synchronization.

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4,315,195

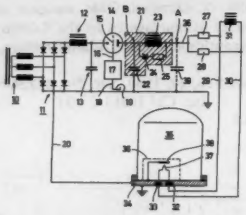
## HIGH-VOLTAGE SUPPLY FOR POWER ELECTRON-BEAM GUNS

Karl-Georg Redel, Rodenbach, and Gerd Deppisch, Aschaffenburg, both of Fed. Rep. of Germany, assignors to Leybold Heraeus GmbH, Rodgau, Fed. Rep. of Germany

Filed May 7, 1980, Ser. No. 147,447
Claims priority, application Fed. Rep. of Germany, May 8, 1979, 2918426
Int. Cl.³ H05B 7/148; H02H 7/20
U.S. Cl. 315—107 4 Claims

1. A high-voltage supply means for power electron-beam guns with a heatable cathode and an anode, particularly for electron-gun vaporizers, with a high-voltage transformer, smoothing means for the residual waviness of the feed voltage, an electronic switching member, which is arranged in the current circuit to the cathode and a switching circuit controlled dependent on current and which cuts in to produce a blocking voltage for operating the switching member, and an impulse protecting filter arranged in the current circuit to the cathode, which filter consists of a capacitor connected in parallel with the cathode/anode section, a choke, a free-running diode blocked in the direction towards the cathode, and a

discharge resistor, the choke being connected in series with the cathode/anode section, and the free-running diode with the



discharge resistor connected in series being connected in parallel with the choke.

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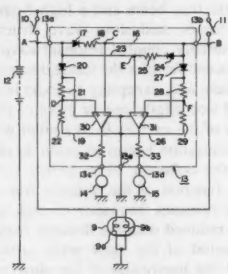
**4,315,196**

**DISCONNECTION DETECTING CIRCUIT OF DOUBLE-FILAMENT SPHERICAL LAMP**

**Fujio Kitayama, Omoriniski, Japan, assignor to Niles Parts Company, Ltd., Tokyo, Japan**

**Filed Dec. 28, 1979, Ser. No. 107,851**
**Claims priority, application Japan, Apr. 12, 1979, 54-44673**
**Int. Cl.³ H05B *39/00, 37/03***
**U.S. Cl. 315—132** **2 Claims**



1. In combination with a double-filament lamp having a first and a second filament connected to a power source by respective circuits which include respective first and second control switches and an indicator device for indicating failure of either filament, an apparatus for detecting the failure of a filament in the lamp and activating said indicator, said apparatus comprising:

a first voltage-dividing circuit connected to said first filament circuit and said indicator which includes said second filament as a voltage-dividing resistor in said first voltage-dividing circuit;

a second voltage-dividing circuit connected to said second filament circuit and said indicator which includes said first filament as a voltage-dividing resistor in said second voltage-dividing circuit;

a first comparator connected to said voltage-dividing circuit and said indicator;

a second comparator connected to said second voltage-dividing circuit and said indicator;

a third voltage-dividing circuit connected to said first filament circuit and said first comparator for setting a reference voltage; and

a fourth voltage-dividing circuit connected to said second filament circuit and said second comparator for setting a reference voltage;

whereby with both filaments intact the heat from the energization of either filament increases the resistance of the remaining filament to increase the voltage potential sensed by the comparator in the circuit of the energized filament to prevent activation of said indicator, and when an energized filament has failed the resistance of the remaining filament is not increased and the voltage potential sensed by the comparator in the circuit of the energized filament remains low to cause said comparator to activate said indicator to signal a failed filament, said respective third and fourth voltage-dividing circuits provide a voltage drop to prevent the non-energized filament from being energized should the energized filament fail.

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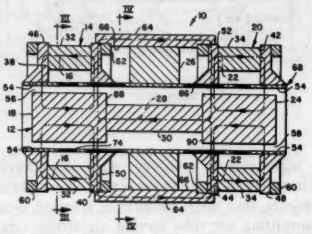
**4,315,197**

**LINEAR MAGNETIC MOTOR/GENERATOR**

**Philip A. Studer, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Feb. 7, 1980, Ser. No. 119,336**
**Int. Cl.³ H02K *41/02***
**U.S. Cl. 318—135** **32 Claims**



1. A linear magnetic motor/generator, comprising:

axially moveable actuator means having three portions;

permanent magnet means including a plurality of pairs of transverse and symmetrical magnets substantially aligned radially and transversely with a common axis and equidistantly spaced around and separated from a first portion of said actuator means, thereby defining a first magnetic flux path passing through said first portion of said axially moveable actuator means;

another permanent magnet means including another plurality of pairs of transverse and symmetrical magnets substantially aligned radially and transversely with said common axis and equidistantly spaced around and separated from a second portion of said actuator means thereby defining a second magnetic flux path passing through said second portion of said axially moveable actuator means;

a plurality of magnetically soft end pieces arranged in a plurality of arrays defining a gap between said end pieces and said actuator whereby facing pairs of said end pieces in adjacent arrays are coupled across opposite ends of said pluralities of permanent magnets; and

coil means defining a third magnetic path passing through a third portion of said axially moveable actuator means and selectively modulating magnetic flux flowing in said first and second magnetic flux paths for supplying an axial force to said axially moveable actuator means.

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**4,315,198**

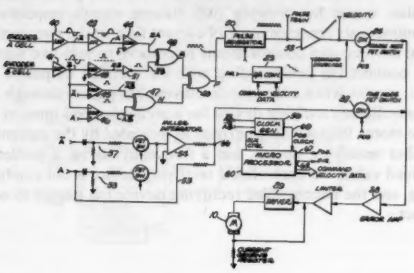
**DIGITAL SERVO SYSTEM**

**Frank W. Lin, Los Altos Hills, and Mei S. Sze, San Jose, both of Calif., assignors to Qume Corporation, San Jose, Calif.**

**Filed Nov. 7, 1979, Ser. No. 91,931**
**Int. Cl.³ G05B *11/18***
**U.S. Cl. 318—594** **14 Claims**

1. In a servo system for controlling the motion of a movable member along a path from a starting position to a destination

position, said member being positioned by a motor and being coupled to means for generating at least two space phase cyclic analog position signals representative of the instantaneous position of said movable member, the periods of said signals being indicative of the instantaneous velocity of said movable member, the improvement comprising means responsive to said two position signals for generating a digital pulse train having a pulse rate indicative of the instantaneous velocity of said member, said means for generating a digital pulse train comprising first, second and third exclusive OR gates, the



outputs of the first and second providing inputs to the third exclusive OR gate, the first exclusive OR gate being responsive to digital signals indicating the polarity of said analog portion signals and the second exclusive OR gate being responsive to digital signals indicating the relative polarity between said analog signals and an inverted one of said analog portion signals, means for integrating said digital pulse train to obtain an analog voltage representative of the pulse rate of said pulse train and control means responsive to said analog voltage for controlling the motion of said motor.

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**4,315,199**

## CONTROL CIRCUIT FOR A POSITIONING DEVICE USING A D-C MOTOR

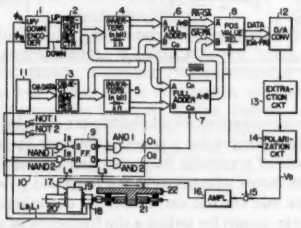
**Ryuichi Kyomasu, Kodaira; Shuichi Hanashima, Tokyo, and Yoshikazu Suzumura, Fuchu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Aug. 3, 1979, Ser. No. 63,450**

**Claims priority, application Japan, Aug. 9, 1978, 53-96229**

**Int. Cl.[3] G05B *19/29***

**U.S. Cl. 318—601** **2 Claims**



1. A control circuit of a positioning device for moving a member to be controlled to a predetermined position by using a d-c motor comprising:

encoder means for receiving first and second repeated pulse signals being produced for each movement of said member to be controlled by a predetermined unit distance and having opposite phases depending upon the opposite directions of said member, and for producing a first trigger signal when said first repeated pulse signal has a phase preceding the phase of the second repeated pulse signal in one moving direction of said member and a second trigger signal when said first repeated pulse signal has a phase lagged behind the phase of said second repeated pulse signal in the other moving direction of said member;

counter means for receiving said first and second trigger signals depending upon the moving directions of said member, and for producing a binary coded signal responsive to a position of said member to be controlled;

memory means for providing a predetermined binary coded signal corresponding to the predetermined position;

arithmetic circuit means for producing a difference binary coded signal representative of the difference between the binary coded signals of said counter means and said memory means;

driving circuit means for driving the d-c motor coupled to said member to be controlled, said driving circuit means producing a driving signal of a level corresponding to the difference binary coded signal of said arithmetic circuit means;

correcting circuit means for receiving said first and second repeated pulse signals and for producing a correcting pulse signal preceding said first or second trigger signal; and

connection means for providing said correcting pulse signal to said arithmetic circuit means so as to cause said difference binary coded signal between the binary coded signals of said counter means and said memory means to be small, whereby the level of the driving signal in said driving circuit means is decreased by said correcting signal.

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**4,315,200**

## SERVO CONTROL APPARATUS

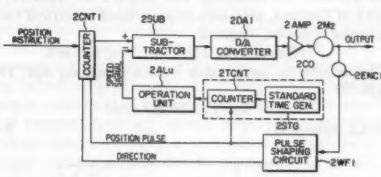
**Yasuaki Yamada, Funabashi; Toshiaki Ozawa, Tokyo, and Hiroatsu Kondo, Zushi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 27, 1979, Ser. No. 69,927**

**Claims priority, application Japan, Aug. 29, 1978, 53-105149; Sep. 20, 1978, 53-115648; Sep. 20, 1978, 53-115649; Sep. 20, 1978, 53-115650; Sep. 20, 1978, 53-115651**

**Int. Cl.[3] G05B *19/28***

**U.S. Cl. 318—603** **9 Claims**



1. A servo control apparatus, comprising:

signal generating means for generating a pulse train of a frequency proportional to the speed of an object to be controlled;

measuring means for measuring the time interval of said pulses;

calculating means for calculating the reciprocal of thus measured time interval; said reciprocal being supplied as the speed component to a servo motor; and

control means coupled to said calculating means for controlling the object in accordance with a control instruction information and the reciprocal of the measured time interval.

## 4,315,201

## ALIGNMENT APPARATUS FOR MASK AND WAFER USED IN MANUFACTURING SEMICONDUCTOR CIRCUIT ELEMENTS

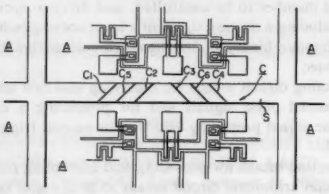
**Akiyoshi Suzuki, Tokyo; Ryozo Hiraga, Yokohama; Ichiro Kano, Yokohama; Hideki Yoshinari, Yokohama; Masao Totsuka, Ohmiya; Yuzo Kato, Yokohama, and Yasuo Ogino, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 8, 1978, Ser. No. 884,534**

**Claims priority, application Japan, Mar. 10, 1977, 54/26304**

**Int. Cl.³ G05B *1/06***

**U.S. Cl. 318—640** **6 Claims**




1. An apparatus for aligning a mask and a wafer comprising:

a mask carrier for holding a mask having alignment marks provided in a narrow strip-like area existing between circuit patterns;

a wafer carrier for holding a wafer having alignment marks provided in a narrow strip-like area existing between circuit patterns;

photoelectric detecting means for scanning said mask and wafer along a scanning line;

electric means for discriminating whether or not said narrow strip-like area on said mask and wafer is coincident with the scanning line and detecting relative displacement between the alignment marks of the mask and wafer;

driving means responsive to said electric means for moving at least one of said carriers relative to the other, said driving means moving said at least one of said carriers in a direction crossing said scanning line until the narrow strip-like areas on the mask and wafer are coincident, and thereafter, moving at least one of said carriers until the alignment marks of the mask and wafer are in a predetermined relation.

## 4,315,202

## SYNCHRONOUS MOTORS

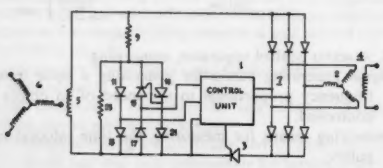
**John Dawson, Northampton, and Stephen M. Buckley, Rugby, both of England, assignors to Associated Electrical Industries Limited, London, England**

**Filed Apr. 8, 1980, Ser. No. 138,865**

**Claims priority, application United Kingdom, Apr. 19, 1979, 13629/79**

**Int. Cl.³ H02P *1/46***

**U.S. Cl. 318—718** **8 Claims**




1. A synchronous motor comprising: a stator winding; a rotor; an a.c. exciter winding mounted on the rotor; a field winding mounted on the rotor and arranged for excitation by the rectified output of the a.c. exciter, and a synchronizing arrangement for delaying energization of the field winding by the exciter until the rotor is rotating approximately at the same speed as the rotating field produced by the stator winding of the motor, and the rotor is correctly positioned relative to this rotating field, the synchronizing arrangement comprising: a pair of rectifying devices connected in parallel, oppositely poled, across the motor field winding, one of the devices being controllable and poled so as to be forward biassed by the rectified output of the a.c. exciter; trigger means for the controllable device whereby the controllable device is rendered conducting when the voltage across the field winding foward biasses said controllable device and exceeds a predetermined value; means for deriving two discrete signals respectively continuously representative of current flow in the two rectifying devices; and control means responsive to said two signals to connect the field winding with the rectified output of the a.c. exciter when either (a) no current has passed through the controllable rectifying device for a predetermined time, or (b) the motor field winding current, as indicated by the current in either rectifying device, has a frequency below a predetermined value, the controllable rectifying device is not conducting, and the uncontrolled rectifying device has started to conduct.

## 4,315,203

## CONTROL SYSTEM FOR INDUCTION MOTOR-DRIVEN CAR

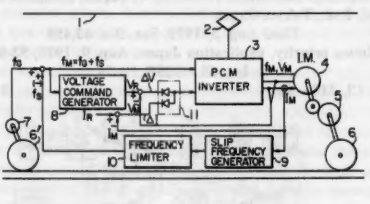
**Masahiko Ibamoto; Hiroshi Narita, both of Katsuta; Noboru Oouchi, Hitachi, and Shigetoshi Okamatsu, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jul. 3, 1980, Ser. No. 166,704**

**Claims priority, application Japan, Jul. 6, 1979, 54-84990**

**Int. Cl.³ H02P *5/40***

**U.S. Cl. 318—807** **11 Claims**




1. A control system for an electric car of an induction motor drive type, comprising a power converter for producing an AC power of a variable frequency and a variable voltage; an induction motor adapted to be fed from said power converter and drive said electric car; means for detecting speed of said electric car; means for setting a slip frequency of said induction motor; means for preparing a frequency command by adding together or subtracting each other said slip frequency and the speed of said electric car; means for controlling the output frequency of said power converter in accordance with said frequency command, means for controlling the output voltage from said power converter; means for producing a current command for said induction motor, and means for producing a voltage command in dependence on the speed of said induction motor, wherein said output voltage control means is so arranged as to control the output voltage of said power converter in accordance with one of said current command and said voltage command under limitation by the other of said current command and said voltage command.

4,315,204

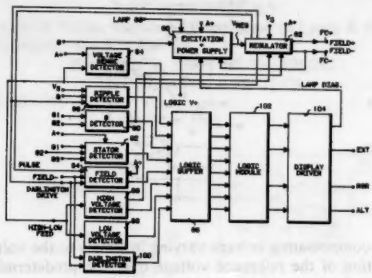
## RIPPLE DETECTOR FOR AUTOMOTIVE ALTERNATOR BATTERY CHARGING SYSTEMS

Kirk A. Sievers, Roselle, and Robert W. Mortonson, Addison, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 22, 1980, Ser. No. 152,223

Int. Cl.[3] H02J 7/14

U.S. Cl. 322—28 15 Claims



1. In a multiphase alternator battery charging system, a detector monitoring the voltage ripple in the rectified electrical output signal of said alternator comprising:

means for monitoring the undulating rectified electrical signal supplied to the battery by said alternator and producing a signal level in response thereto,

means coupled to said alternator for measuring the rotational speed in said alternator and producing a signal level in response thereto;

means coupled to the field coil of said alternator determining the excitation current supplied thereto;

variable threshold means, combining the output signal from said rotational speed means and said determined field coil excitation current, producing a combined signal level; and

comparison means, responsive to the signal level from said monitoring means and said combined signal level, producing an output signal level indicative of the detection of a voltage ripple in excess of said combined signal level.

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4,315,205

## GENERATION CONTROL APPARATUS FOR VEHICLE GENERATORS

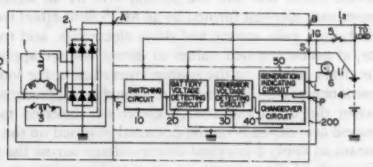
Kazumasa Mori, Aichi; Taro Asahi, Chiryu; Keiichiro Banzai, Toyota; Katsutaro Iwaki, Chiryu; Katsuya Muto, Kariya; Akira Mase, Handa; Takayasu Nimura, Nagoya; Katsumi Itoh, Ohbu, and Yoshio Akita, Ichinomiya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 23, 1980, Ser. No. 152,823

Claims priority, application Japan, Aug. 3, 1979, 54-6597; Aug. 3, 1979, 54-99560; Sep. 7, 1979, 54-115473

Int. Cl.[3] H02J 7/14

U.S. Cl. 322—99 7 Claims



1. In a generation control apparatus for vehicle generators including a generator having armature coils, an excitation coil and a rectifier for rectifying an AC output from said armature coils, and a battery arranged to be charged by a DC output of said rectifier, the improvement comprising:

a voltage control circuit responsive to the terminal voltage of said battery to control the energization of said generator;

a fault detecting circuit for detecting whether the terminal voltage of said battery or the output voltage of said generator is normal so as to generate a fault detection signal when at least one of said voltages is not normal; and

a changeover circuit responsive to said fault detection signal to effect the control of the energization of said generator in accordance with the output voltage of said generator instead of said battery terminal voltage.

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4,315,206

## CURRENT SUPPLY CIRCUIT FOR TELEPHONE EXCHANGE

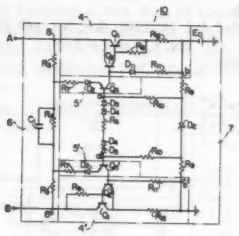
Michio Tokunaga, Zushi; Ryoichi Okada, Iruma; Hideo Mizutani, Warabi; Koichi Hasegawa, Tokyo, and Takaaki Osaki, Yokohama, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation; Oki Electric Industry Co., Ltd.; Nippon Electric Co., Ltd.; Fujitsu Ltd. and Hitachi, Ltd., all of Tokyo, Japan

Filed Sep. 24, 1979, Ser. No. 78,469

Claims priority, application Japan, Sep. 22, 1978, 53-115766; May 23, 1979, 54-62640

Int. Cl.[3] G05F 1/44

U.S. Cl. 323—265 33 Claims



1. A current supply circuit comprising:

a pair of current-supplying current amplifiers, a pair of output terminals of each of said current-supplying current amplifiers being series-connected between a load and one of power supply te...inals;

an output voltage detector parallel-connected with said load and including an impedance element;

a pair of driving current amplifiers, a pair of output terminals of each of said driving current amplifiers being connected between an input terminal of each of said current-supplying current amplifiers and one of output terminals of said output voltage detector, said driving current amplifier, said current-supplying current amplifier and said output voltage detector making up a negative feedback loop; and

an input current supply circuit connected between input terminals of said driving current amplifiers and including a power supply.

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4,315,207

## CURRENT CONTROLLED BATTERY FEED CIRCUIT

Russell J. Apfel, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 20, 1980, Ser. No. 161,490

Int. Cl.[3] G05F 1/46

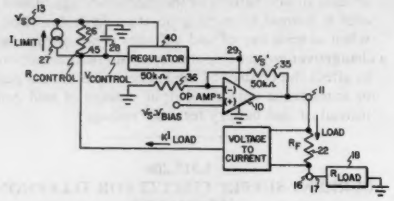
U.S. Cl. 323—284 16 Claims

1. A battery feed circuit for supplying a D.C. load current to a load from a source of D.C. voltage comprising

feedback means responsive to said load current for generating a feedback current proportional to said load current,

impedance means responsive to said feedback current for generating a control voltage proportional to said feedback current,

bias means responsive to said D.C. source voltage for generating a biased voltage having a predetermined relationship with respect to said source voltage,




amplifier means responsive to said biased voltage and control voltage for generating an output voltage in a negative feedback relationship to said load current, said output voltage driving said load current.

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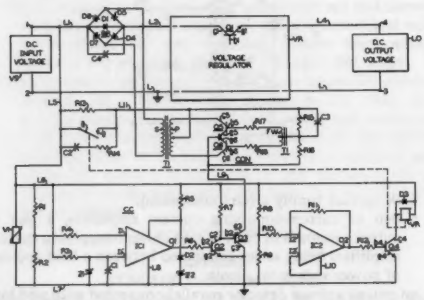
**4,315,208**

**REGULATED POWER SUPPLY HAVING ITS D.C. VOLTAGE SOURCE SELECTIVELY SUPPLEMENTED BY A D.C. TO D.C. CONVERTER**

**John M. McElroy, Monroeville, and John O. G. Darrow, Murrysville, both of Pa., assignors to American Standard Inc., Swissvale, Pa.**

**Filed Jul. 14, 1980, Ser. No. 167,857**
**Int. Cl.³ G05F *5/00***
**U.S. Cl. 323—303** **11 Claims**




1. A regulated power supply comprising, a regulator connectable between a d.c. voltage source and a load for regulating the d.c. voltage source so that a constant d.c. voltage is developed across the load, and a controllable d.c. to d.c. converter connectable between the d.c. voltage source and said regulator for selectively adding supplementary d.c. voltage when the magnitude of the d.c. voltage source falls below a predetermined value.

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**4,315,209**

**TEMPERATURE COMPENSATED VOLTAGE REFERENCE CIRCUIT**

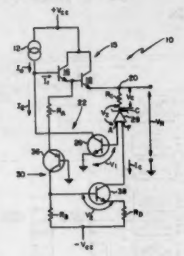
**James C. Schmoock, San Jose, Calif., assignor to Raytheon Company, Lexington, Mass.**

**Filed Jul. 14, 1980, Ser. No. 168,788**
**Int. Cl.³ G05F *3/20***
**U.S. Cl. 323—313** **8 Claims**

1. A temperature compensated voltage reference circuit, comprising:

(a) means for producing an output voltage at an output terminal comprising a reference voltage device connected between a predetermined voltage potential and the output terminal, such reference voltage device producing a reference voltage varying with temperature over a predetermined range temperatures; and

(b) means, responsive to a compensating current, for producing a compensating voltage in series with the reference voltage,



such compensating voltage varying inversely to the voltage variation of the reference voltage over the predetermined range of temperatures, such compensating current passing serially through the reference voltage device and the compensating voltage producing means.

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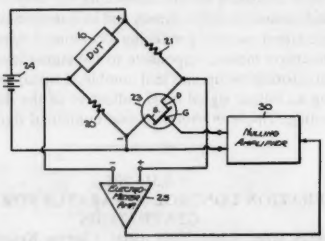
**4,315,210**

**BRIDGE-BALANCING SYSTEM FOR MEASURING EXTREMELY LOW CURRENTS**

**Thomas J. Michel, Hialeah, and Robert Clarke, Cooper City, both of Fla., assignors to Santek, Inc., Hollywood, Fla.**

**Filed Jan. 7, 1980, Ser. No. 110,251**
**Int. Cl.³ G01R *27/00, 27/02***
**U.S. Cl. 324—57 R** **7 Claims**




1. A bridge-balancing system for measuring direct current flow having an intensity in the sub-nanoampere range passing through a device under test having an extremely high impedance, said system comprising:

A. a bridge network having two sets of opposing arms to define input and output diagonals, one set of arms being constituted by a pair of fixed resistors having matching values, the first arm in the other set being formed by the device under test and the second arm by an adjustable impedance element formed by an MOS field-effect transistor having gate, source and drain electrodes, said transistor, at predetermined values of direct voltage applied to the drain relative to the source, operating in the variable resistance region in which the impedance presented between the drain and source electrodes inserted in said second arm depends on the potential imposed on the gate;

B. means to apply a constant direct voltage across the input diagonals of the network to cause said transistor to operate in the variable resistance region;

C. an amplifier having a high input impedance connected across the output diagonals of the network to produce an analog signal whose sense and magnitude depend on the

difference between the impedance of the device and that of the field-effect transistor; and

D. means to impose a potential on said gate having a level which brings the network into balance and nulls said signal.

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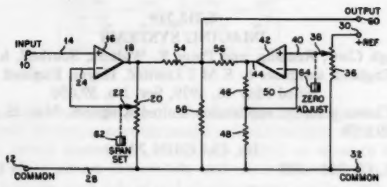
## 4,315,211
## PREAMPLIFIER FOR VOLTAGE MEASURING INSTRUMENT WITH NON-INTERACTING ZERO AND SPAN CONTROLS

**Thomas J. Walsh, Hatboro, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.**

**Filed Mar. 3, 1980, Ser. No. 126,752**
**Int. Cl.³ G01R *1/30, 15/08***
**U.S. Cl. 324—123 R** **6 Claims**




1. A preamplifier for a voltage measuring circuit with a span and zero adjusting circuit, comprising:

a first amplifying circuit means having its input connected to a source of potential to be measured, said circuit being operable to produce at its output a voltage which has a proportional relationship to the voltage of said input with the relationship being continuously adjustable to determine the span of the measuring circuit;

a second amplifying circuit means having its input connected to a reference potential, said circuit being operable to produce at its output a voltage having a predetermined proportional relationship to said reference voltage, said predetermined relationship being adjustable to vary the effective zero of the measuring circuit; and

a summing network including a separate impedance in series with the output of each of said amplifying circuits and another impedance connected to said series impedances, so that said other impedance carries the current output from both amplifying circuits to produce a potential across said other impedance as an output from said preamplifier which is proportional to the sum of the voltage outputs of said amplifying circuits.

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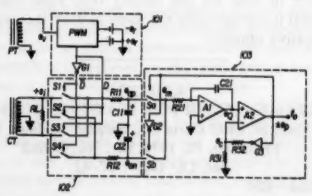
## 4,315,212
## ELECTRONIC WATTHOUR METER

**Ryouji Gamoh, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Jul. 6, 1979, Ser. No. 55,480**
**Claims priority, application Japan, Jul. 6, 1978, 53-82232**
**Int. Cl.³ G01R *21/06, 11/16***
**U.S. Cl. 324—142** **12 Claims**




1. An electronic watthour meter for measuring the instantaneous power of a supply line by multiplying a first voltage signal proportional to the load voltage of said power line and a second voltage signal proportional to the consumption current of said line, comprising:

a pulse width modulation circuit controlled by said first voltage signal for producing pulse wave modulated signals proportional to the amplitude of said first signal in order to provide a voltage pulse width duty cycle signal;

a multiplication circuit having a plurality of analog switches which are selectively operated by said pulse width duty cycle signal from said pulse width modulation circuit so that positive and negative DC voltages, equal in absolute value, are obtained which represent the product of said second voltage signal and said first voltage signal;

a frequency conversion circuit for converting said positive and negative DC voltages into a frequency signal.

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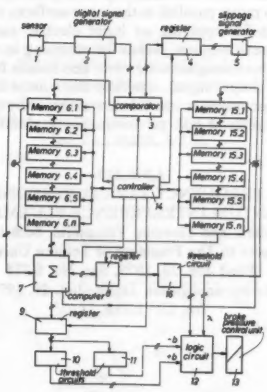
## 4,315,213
## METHOD FOR OBTAINING AN ACCELERATION OR DECELERATION SIGNAL FROM A SIGNAL PROPORTIONAL TO SPEED AND APPARATUS THEREFOR

**Manfred Wolff, Ladenburg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Apr. 29, 1980, Ser. No. 145,200**
**Claims priority, application Fed. Rep. of Germany, May 10, 1979, 2918802**
**Int. Cl.³ G01P *3/42***
**U.S. Cl. 324—162** **8 Claims**



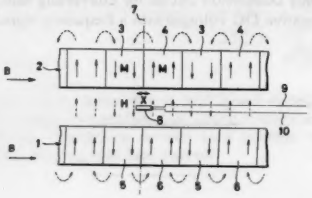

1. A method for obtaining an acceleration or deceleration signal from a signal sensor proportional to a speed, comprising measuring at successive times, of which adjacent times are at a constant interval of $\Delta T$ from one another, the change of the speed signal relative to the particular speed signal present at the foregoing time and the acceleration or deceleration signal obtained by means of addition of a predetermined number of successive changes, storing each measured change is stored in a memory having at least n memory possibilities for these changes, obtaining a signal at intervals of $\Delta T$ of the acceleration or deceleration signal from the particular n changes most recently stored and erasing at intervals of $\Delta T$ the particular change stored earliest in the memory.

**4,315,214**

## DISPLACEMENT SENSOR USING A GALVANOMAGNETIC ELEMENT POSITIONED IN A PERIODICALLY INVERTED MAGNETIC FIELD

**Shoei Kataoka, Tanashi, Japan, assignor to Agency of Industrial Science & Technology Ministry of International Trade & Industry, Tokyo, Japan**

**Filed Aug. 28, 1979, Ser. No. 70,653**
**Claims priority, application Japan, Aug. 30, 1978, 53-104976**
**Int. Cl.³ G01B *7/14*; G11C *19/08***
**U.S. Cl. 324—208** **7 Claims**



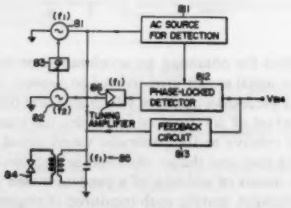
1. A displacement sensor for detecting very minute displacements in a non-contact state, which sensor comprises a pair of plates of magnetic bubble material disposed in parallel with each other with a space left therebetween, means for applying external magnetic fields in parallel to said pair of plates said pair of plates having magnetic strip domains formed therein at regular intervals by application of external magnetic fields in parallel to the surfaces of said pair of plates, said space consequently forming therein magnetic fields periodically alternately inverted in the lengthwise direction of said pair of plates, a galvanomagnetic element disposed within said magnetic fields to be retained in a non-contact relation with said pair of plates, means for retaining said galvanomagnetic element so as to move parallel to the inner surfaces of said pair of plates, means for applying an input electric current to said galvanomagnetic element, means for obtaining an output signal from said galvanomagnetic element, and means for measuring the obtained output signal, whereby the minute displacements of said galvanomagnetic element are detected by the change of the output signals of said galvanomagnetic element obtained.

**4,315,215**

## PLURAL FREQUENCY TYPE SUPERCONDUCTING QUANTUM INTERFERENCE FLUXMETER

**Yutaka Onodera, and Tsutomu Yamashita, both of Sendai, Japan, assignors to The President of Tokoku University, Japan**

**Filed Jan. 23, 1979, Ser. No. 5,775**
**Claims priority, application Japan, Jun. 25, 1978, 53/76900**
**Int. Cl.³ G01R *33/02***
**U.S. Cl. 324—248** **6 Claims**



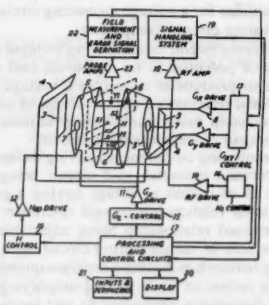

1. A superconducting quantum interference fluxmeter, comprising an electric circuit containing a SQUID (superconducting quantum interference device) and a resonant circuit electromagnetically coupled with said SQUID, means for applying to said SQUID through said resonant circuit at least two different radio frequency exciting currents of which the frequencies are integral multiples or integral fractions of one another, means for controlling the phase relationship of said exciting currents, tuned amplifier means coupled with said resonant circuit for amplifying from among frequency components of the output of said SQUID only a frequency which is the frequency of one only of said exciting currents and means for detecting external magnetic flux applied to said SQUID by amplifying and detecting the alternating current amplified by said amplifier means, said exciting currents being selected to produce in said SQUID, by the combined effect of said currents, internal magnetic flux which is below a critical value at which said electric circuit produces an output in the absence of external flux applied to said SQUID.

**4,315,216**

## IMAGING SYSTEMS

**Hugh Clow, Reading, and Peter E. Walters, Southall, both of England, assignors to E M I Limited, Hayes, England**

**Filed May 16, 1979, Ser. No. 39,650**
**Claims priority, application United Kingdom, May 25, 1978, 22292/78**
**Int. Cl.³ G01N *27/00***
**U.S. Cl. 324—309** **16 Claims**




1. A nuclear magnetic resonance apparatus, for examining a slice of a body, the apparatus including:

means for applying first magnetic fields to cause resonance preferentially in said slice;

means for applying a further magnetic field which is pulsed and which has a gradient across the slice to produce phase dispersion in said resonance, the said means for applying the further field being arranged to cause a pulse, of said further, field whose rising and falling edges are not vertical; and

means for sensing a resonance signal induced during said further field; wherein control means are provided for causing the means for sensing to sample the induced signal at intervals for each of which there is a field integral with respect to time for the further field such that the field integral is substantially the same in each interval between successive samples.

**4,315,217**

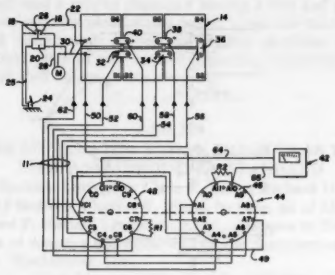
## BATTERY ANALYZER FOR ELECTRIC GOLF CARTS

**John M. Sharber, 1408 Doris Dr., Sulpher Springs, Tex. 75482**

**Filed Sep. 10, 1979, Ser. No. 73,682**
**Int. Cl.³ G01N *27/42***
**U.S. Cl. 324—434** **1 Claim**

1. A battery tester in a vehicle comprising: an electrically driven vehicle; a plurality of wet cell batteries mounted in said vehicle to provide a power source; an electric motor drivingly connected to said vehicle; switch means to connect the batter-

ies to said motor; an electric meter secured to said vehicle for measuring voltage; a multi-pole rotary switch having resistors for forming a voltage divider; connector lines connecting said rotary switch to said meter; electric connectors secured between each pole of said batteries and at least one pole of said



switch such that voltage of said individual battery can be measured; electric connector means secured between each side of said switch means and said rotary switch to measure the voltage drop across the switch; and electric connectors secured between each side of said electric motor and to a pole of said rotary switch to measure voltage drop across said motor.

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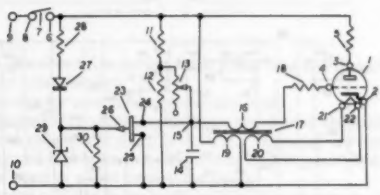
**4,315,218**

**GASEOUS TUBE CONTROL CIRCUIT**

**John C. Rankin, 908 S. Hobart Blvd., Los Angeles, Calif. 90006**

**Filed Oct. 12, 1979, Ser. No. 84,107**
**Int. Cl.³ H03K** *5/13, 23/22*
**U.S. Cl. 328—8** **1 Claim**



1. A gaseous tube control circuit comprising:
- a bias voltage applied between grid and cathode of said gaseous tube to prevent current flow between plate and said cathode in the absence of an initial firing voltage applied between said grid and said cathode;
- a timing circuit for firing said gaseous tube consisting of a resistor and a capacitor;
- a source of alternating current pulses having a first and second output terminal with said first output terminal effectively connected to said plate and said second output terminal effectively connected to said cathode;
- the first lead of said resistor connected to the first output terminal of said source of alternating current pulses;
- the second lead of said resistor connected to the first lead of said capacitor to form a junction and the second lead of said capacitor connected to the said second terminal of said source of alternating current pulses;
- means for connecting said junction to said grid and said second lead of said capacitor to said cathode;
- a field effect transistor having the drain effectively connected to said first lead of said capacitor and the source connected to said second lead of said capacitor;
- means for applying voltage pulses between the gate and said source of said field effect transistor so that the resistance between said drain and said source is high to allow charging of said capacitor through said resistor with the voltage polarity required to fire said grid of said gaseous tube and so that the resistance between said drain and said source is low to discharge said capacitor when said alternating current pulses are at and passing through zero amplitude.

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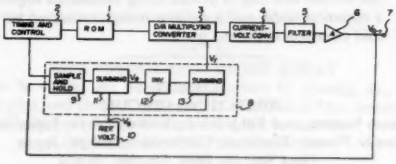
**4,315,219**

**AMPLITUDE CONTROLLED DIGITAL OSCILLATOR**

**David Rocheleau, and Karl Ayukawa, both of Ottawa, Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada**

**Filed Apr. 7, 1980, Ser. No. 138,176**
**Int. Cl.³ H03K** *13/02*
**U.S. Cl. 328—14** **5 Claims**



1. A digital oscillator comprising:
- digital to analog multiplying converter means for multiplying a parallel binary number by a reference signal to produce an analog output;
- memory means for storing a desired waveform in binary numbers, said memory means coupled to the converter means;
- control means for driving the memory means to sequentially transfer binary numbers to the converter means at a desired rate; and
- detector means coupled to the converter means output for monitoring the amplitude of the analog output and for controlling the reference signal to the converter means.

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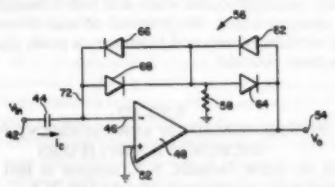
**4,315,220**

**PEAK DETECTOR CIRCUIT**

**Heinz H. Findeisen, Milford, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.**

**Filed Jun. 25, 1979, Ser. No. 51,964**
**Int. Cl.³ H03K** *5/153*
**U.S. Cl. 328—150** **1 Claim**



1. A circuit for detecting the maxima and minima of an input voltage waveform comprising:
- two-terminal input and output ports;
- a first terminal of each port being connected to the first terminal of the other port to establish a common reference point;
- a capacitor having first and second leads;
- the second terminal of the input port being connected to a first lead of the capacitor;
- an operational amplifier having inverting and non-inverting inputs and an output;
- the second lead of the capacitor being connected to the inverting input of the operational amplifier;

the non-inverting input of the operatinal amplifier being connected to the common reference point; and

a diode-resistor bridge network connected between the output and the inverting input of the operational amplifier, said network comprising:

a first diode whose anode is connected to the output of the operational amplifier,

a second diode whose cathode is connected to the output of the operational amplifier,

a third diode whose anode is connected to the inverting input of the operational amplifier,

a fourth diode whose cathode is connected to the inverting input of the operational amplifier,

the cathodes of the first and third diode and the anodes of the second and fourth diodes being connected together at a common node, and a resistor being connected between said common node and ground.

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**4,315,221**

## SWITCHING CIRCUIT

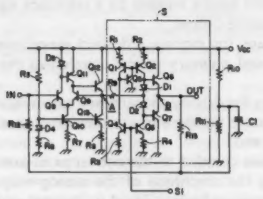
**Tatsuo Numata, and Kohji Ishida, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Sep. 25, 1979, Ser. No. 78,621**

**Claims priority, application Japan, Sep. 27, 1978, 53-118816**

**Int. Cl.³ H03F *3/30;* H03G *3/34***

**U.S. Cl. 330—51** **6 Claims**



1. In a single-ended push-pull circuit in which the emitters of a PNP transistor and an NPN transistor are commonly connected, the same signal is applied to the bases of said two transistors, and an output is provided at the commonly-connected emitters of said two transistors, the improvement comprising: a switching circuit in which a bias current applied to said two transistors is turned on and off by a current mirror circuit, and a resistor is connected between said commonly-connected emitters providing said output and a source of middle point potential so that when said two transistors are rendered nonconductive, the potential of said commonly-connected emitters of said two transistors is made equal to said middle point potential.

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**4,315,222**

## POWER COMBINER ARRANGEMENT FOR MICROWAVE AMPLIFIERS

**Adel A. M. Saleh, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Mar. 6, 1980, Ser. No. 127,785**

**Int. Cl.³ H03F *3/68***

**U.S. Cl. 330—124 D** **7 Claims**

1. A microwave power combiner arrangement comprising:

N microwave amplifiers ($12_1$, $12_2$, . . . , $12_N$), each amplifier capable of receiving and amplifying a separate one of a plurality of N input signals;

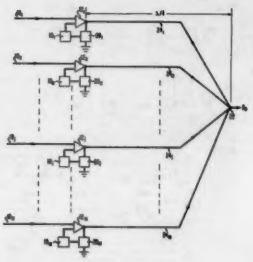
N transmission lines ($24_1$, $24_2$, . . . , $24_N$), each transmission line of a predetermined length $\lambda/4$ and coupled to the output of a separate one of said N microwave amplifiers; and

a common point (22) coupled to each transmission line at said predetermined length $\lambda/4$ from its associated amplifier, capable of combining said N amplified input signals;

CHARACTERIZED IN THAT

the microwave power combiner arrangement further comprises

N sensing means ($19_1$, $19_2$, . . . , $19_N$), each sensing means coupled to a separate one of the N microwave amplifiers and capable of sensing an amplifier failure; and



N devices ($20_1$, $20_2$, . . . , $20_N$; $30_1$, $30_2$, . . . , $30_N$), each device coupled between a separate one of said N sensing means and an end of the transmission line associated therewith capable of being activated by said sensing means and coupling said transmission line and the common point.

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**4,315,223**

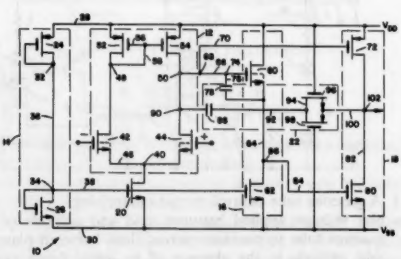
## CMOS OPERATIONAL AMPLIFIER WITH IMPROVED FREQUENCY COMPENSATION

**Yusuf A. Haque, Santa Clara, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.**

**Filed Sep. 27, 1979, Ser. No. 79,341**

**Int. Cl.³ H03F *3/45***

**U.S. Cl. 330—253** **3 Claims**



1. An operational amplifier circuit comprising:

a pair of power conductors adapted to be connected to two potential sources at different levels;

a bias means connected to said conductors;

a differential amplifier connected to said bias means and having an output node;

a level shift means comprising first and second MOS transistors, the gate of said first transistor being connected to said output node of said differential amplifier, and the gate of said second transistor being connected to said bias means, the drain of said first MOS transistor being connected to one of said pair of power conductors, the source of said first MOS transistor being connected to the drain of said second MOS transistor, and the source of said second MOS transistor being connected to the second of said pair of power conductors;

an output stage connected to said level shift means; and

frequency compensation means connected between said differential amplifier and said output stage for allowing the dominant pole of the circuit transfer function to be situated at a relatively high frequency that increases the

gain bandwidth of the circuit, wherein said frequency compensation means comprises a first capacitor having a first and a second plate, said first plate of said first capacitor connected to said output node on said differential amplifier and said second plate of said first capacitor connected to a transmission gate connected to said output stage; and a second capacitor having a first and a second plate, said first plate of said second capacitor connected to said output node of said differential amplifier and said second plate of said second capacitor connected to said level shift means.

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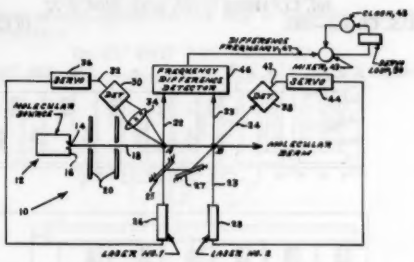
4,315,224

## LASER STIMULATED RAMAN MOLECULAR BEAM TIME AND FREQUENCY STANDARD

**Shaoul Ezekiel, Lexington; Clare C. Leiby; Richard H. Picard, both of Bedford; Charles R. Willis, Newton, all of Mass., and Richard P. Hackel, Livermore, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

Filed May 16, 1980, Ser. No. 150,523
Int. Cl.[3] H03L *7/26*
U.S. Cl. 331—3 9 Claims




1. A stimulated Raman molecular beam time and frequency standard comprising:

(a) means for producing a molecular beam

(b) means for producing a first beam of coherent electromagnetic radiation at a first preselected frequency and directing said first beam in a direction intersecting said molecular beam at a first preselected point,

whereby said first beam intersecting said molecular beam at said first preselected point pumps the molecules of said molecular beam from an initial state to an intermediate state from which said molecules fluoresce to a final state thereby state selecting said molecular beam,

(c) first means for detecting said fluorescence emitted from said intermediate state to said final state and producing a signal in accordance therewith,

(d) means operably connected between said first detecting means and said means for producing said first electromagnetic beam for feeding said signal thereto in order to lock said preselected frequency of said first beam to the resonant frequency corresponding to the transition between said initial state and said intermediate state,

(e) means for producing a second beam of coherent electromagnetic radiation at a second preselected frequency and directing said second beam in a direction intersecting said molecular beam at a second preselected point,

(f) means for directing a portion of said first beam in the form of a third beam at said first preselected frequency in a direction intersecting said molecular beam at said second preselected point simultaneous with said second beam,

whereby said second beam together with said third beam intersecting said state selected molecular beam at said second preselected point causes a direct transition between said initial state and said final state in a stimulated Raman process,

(g) second means for detecting the point of maximum gain of said third beam and producing a signal in accordance therewith,

(h) means operably connected between said second detecting means and said means for producing said second electromagnetic beam for feeding said signal thereto in order to lock said preselected frequency of said second electromagnetic beam to a resonant frequency corresponding to the transition between said final state and said intermediate state, and

(i) means optically aligned with said first and second locked electromagnetic beams for detecting a difference in frequency therebetween, said frequency detecting means producing an output signal representative of said frequency difference.

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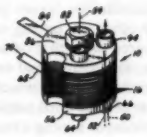
4,315,225

## HEAT SINK LASER DIODE ARRAY

**Louis B. Allen, Jr., Florissant; Herbert G. Koenig, Jr., St. Charles, and Danny D. Meyer, St. Louis, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.**

Filed Aug. 24, 1979, Ser. No. 69,311
Int. Cl.[3] H01S *3/19*
U.S. Cl. 372—35 10 Claims



1. An array of heat sink mounted laser diodes including:

at least two heat sink mounted laser diode assemblies, each assembly being comprised of first and second mounting plates of a predetermined shape, each mounting plate having a solder pad of a predetermined shape thereon, a laser diode soldered between said first and second mounting plates to said solder pads, at least one spacer positioned between said mounting plates having a shape similar to said predetermined shape of said mounting plates and in addition having a cutout adjacent said solder pads, adhesive to retain said spacer to said mounting plates, orienting means and means for conducting coolant;

a heat sink mounted laser diode assembly spacer positioned between said first and second mounting plates of adjacent assemblies, said heat sink mounted laser diode assembly spacer including means for conducting coolant between said adjacent assemblies;

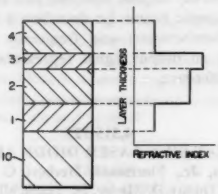
first and second contact plates, said first contact plate being positioned in electrical communication with said first mounting plate of one of said assemblies and said second contact plate being positioned in electrical communication with said second mounting plate of another one of said assemblies to form a series circuit to feed electrical power to said laser diodes; and

means to retain said array in a unitary structure.

## 4,315,226
## SEMICONDUCTOR LASER DEVICE

Naoki Chinone; Kazutoshi Saito, both of Hachioji; Noriyuki Shige, Takasaki, and Ryoichi Ito, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 20, 1979, Ser. No. 77,735
Claims priority, application Japan, Sep. 20, 1978, 53-114676; Mar. 23, 1979, 54-36822
Int. Cl.³ H01S 3/19
U.S. Cl. 372—45 15 Claims




1. In a semiconductor laser device, an optical confinement region constituted by at least first, second, third and fourth semiconductor layers successively laminated on a predetermined semiconductor substrate, and a fifth semiconductor layer burying at least said second, third, and fourth semiconductor layers at each side face thereof which extends in parallel to the propagating direction of the laser ray, said second semiconductor layer having a relatively small refractive index as compared with that of said third semiconductor layer, said first and fourth semiconductor layers being of conductivity types opposite to each other and having relatively small refractive indexes as compared with that of said second and third semiconductor layers, said fourth and second semiconductor layers having respective band gaps which are relatively large as compared with that of said third semiconductor layer, and the fifth semiconductor layer having a smaller refractive index and a larger band gap than at least those of said third semiconductor layer, wherein difference in the band gap at least between said second semiconductor layer and said third semiconductor layer is selected not smaller than 0.15 eV.

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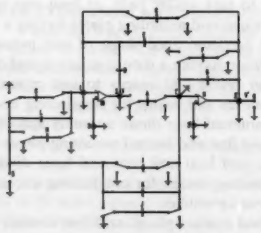
## 4,315,227
## GENERALIZED SWITCHED-CAPACITOR ACTIVE FILTER

Paul E. Fleischer, Little Silver, N.J., and Kenneth R. Laker, Staten Island, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 5, 1979, Ser. No. 100,293
Int. Cl.³ H03H 19/00; H03K 5/153
U.S. Cl. 333—173 10 Claims



1. A switched-capacitor active filter comprising:
first and second operational amplifiers (10, 11), each having an inverting input port (1, 1'), a noninverting input port (2, 2'), and an output port (3, 3');
a diagonally-switched capacitor (A) connecting the output port (3) of the first amplifier (10) to the inverting input port (1') of the second amplifier (11);
an unswitched feedback capacitor (D) connected between the output port (3) of the first amplifier (10) and the inverting input port (1) of the first amplifier (10);
an unswitched feedback capacitor (B) connected between the output port (3') of the second amplifier (11) and the inverting input port (1') of the second amplifier (11);
a through-switched capacitor (C) connected between the output port (3) of the second amplifier (11) and the inverting input port (1) of the first amplifier (10);
input circuit means for coupling an input terminal (5) of the filter to the inverting input port (1, 1') of at least one of the first and second amplifiers (10, 11); and
damping means (E, F).

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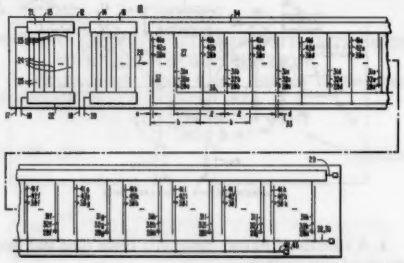
## 4,315,228
## MULTIPLE CO-SURFACE ACOUSTIC WAVE FILTERS

Robert A. Moore, Arnold, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 3, 1980, Ser. No. 165,580
Int. Cl.³ H03H 9/145, 9/42, 9/64, 9/72
U.S. Cl. 333—193 15 Claims



1. Apparatus for providing a plurality of filtered outputs comprising:
a substrate having a surface suitable for propagating surface acoustic waves,
an input transducer for launching surface acoustic waves in said substrate,
a first plurality of evenly spaced-apart taps coupled together for providing a first output signal,
a second plurality of spaced-apart taps coupled together for providing a second output signal,
at least two of said second plurality of taps positioned in spaces between said first plurality of taps and wherein the spacing between said first plurality of taps is less than the spacing between said second plurality of taps.

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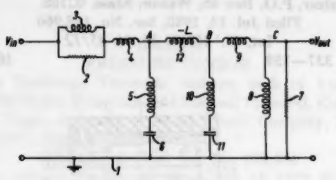
## 4,315,229
## BANDSTOP FILTERS

Alan J. Greaves, Ipswich; Philip E. Greenaway, and Charles Nightingale, both of Felixstowe, all of England, assignors to The Post Office, London, England

Filed Feb. 27, 1980, Ser. No. 125,049
Claims priority, application United Kingdom, Mar. 2, 1979, 07375/79
Int. Cl.³ H03H 11/04, 7/075
U.S. Cl. 333—216 12 Claims

1. An electrical filter network exhibiting a bandstop response, characterised in that the network exhibits electrical signal transfer characteristics substantially equivalent to those

of a passive low pass or high pass LC ladder network including at least one negatively valued inductance or capacitive impedance element and at least one substantially lossless resonant circuit.



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**4,315,230**

## TEST HEAD PRODUCING DIFFERENT FREQUENCIES FOR ENDOR-TRIPLE EXPERIMENTS

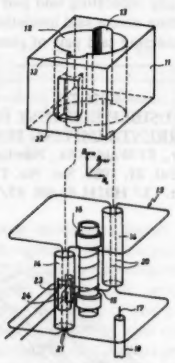
**Reinhard Biehl, Kassel, and Dieter Schmalbein, Karlsruhe-Durlach, both of Fed. Rep. of Germany, assignors to Bruker Analytische Messtechnik GmbH, Fed. Rep. of Germany**

**Filed Apr. 22, 1980, Ser. No. 142,652**

**Claims priority, application Fed. Rep. of Germany, Apr. 30, 1979, 2917471**

**Int. Cl.³ H01P *7/06;* H03C *7/02***

**U.S. Cl. 333—227** **6 Claims**



1. A test head for ENDOR - triple experiments comprising a cylindrical cavity resonator including means for exciting electromagnetic field in the $TM_{110}$ mode, means projecting into the interior of said cavity resonator at diametrically opposite points on the wall thereof and extending over the entire length thereof, said projecting means acting to modify the electro magnetic field to provide resonance conditions for a pair of degenerated $TM_{110}$ modes having different resonance frequencies and being substantially orthogonal to each other.

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**4,315,231**

## HIGH-SPEED CIRCUIT BREAKER

**Hisashi Kondo; Shozo Yamazaki, and Yukio Yamada, all of Katsuta, Japan, assignors to Hitachi, Limited, Tokyo, Japan**

**Filed Dec. 9, 1980, Ser. No. 214,695**

**Claims priority, application Japan, Dec. 10, 1979, 54/159150**

**Int. Cl.³ H01H *7/03***

**U.S. Cl. 335—61** **8 Claims**

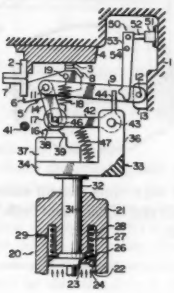
1. A high-speed breaker for an electric circuit, comprising:

a pair of opposed contacts;

a movable holder holding thereon one of said pair of contacts, said movable holder being movable toward and away from the other contact between an ON-position where said one contact engages with said the other contact and an OFF-position where said one contact is disengaged from said the other contact;

first actuating means for actuating said movable holder to move the same between said ON-position and said OFF-position, said first actuating means including an actuating rod and a head connected to one end of said actuating rod, said movable holder being engageable with said head, said actuating rod being reciprocally movable axially thereof toward and away from said the other contact between first position where said head engages with said movable holder to move the same to said ON-position and a second position where said movable holder is moved to said OFF-position;

a release member having one end thereof connected to said head, said release member being movable between an engaging position where the other end of said release member engages with said movable holder and a disengaging position where the other end of said release member is disengaged from said movable holder to move the same from said ON-position to said OFF-position;



second actuating means operative in response to overcurrent passing through said electric circuit when said actuating rod of said first actuating means is in said first position, for actuating said release member to cause the same to move from said engaging position to said disengaging position; and

the axis of said actuating rod of said first actuating means having an extension located between a position where said movable holder engages with said head and a position where said one end of said release member is connected to said head.

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**4,315,232**

## SUBMINIATURE AUDIO TRANSFORMER

**Henry Spoldi, 43 Rockledge Rd., Bronxville, N.Y. 10708, and Joseph N. Sweeney, 9 Locust La., Huntington, N.Y. 11743**

**Filed Feb. 7, 1980, Ser. No. 119,447**

**Int. Cl.³ H01F *15/10, 27/30***

**U.S. Cl. 336—90** **8 Claims**

1. A subminiature transformer comprising:

a bobbin having an annular bobbin shaft having an open center section.

a first flange at one end of said shaft and a second flange at the opposite end of said shaft,

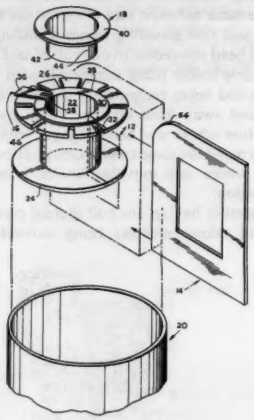
a rim extending beyond said first flange,.and

a split extending for the entire length of said bobbin into said center section;

a plurality of terminal members positioned on said rim;

a plurality of gapless transformer core laminations forming a

core stack, each of said laminations being passed through said split to link with said bobbin; and



a plurality of wire coils wound about said bobbin between said flanges, each end of each said coils being connected to one of said terminals.

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**4,315,233**

## DEVICE FOR SHIFTING A DOUBLE-THROW CONTACT ARRANGEMENT

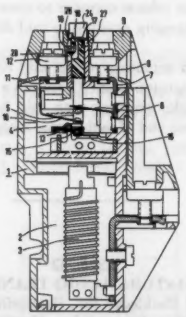
**Albert Warnest, Freudenberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Mar. 28, 1980, Ser. No. 134,897**

**Claims priority, application Fed. Rep. of Germany, Apr. 11, 1979, 2914775**

**Int. Cl.³ H01H *71/16***

**U.S. Cl. 337—66** **5 Claims**



1. In a device for use, in a thermally operated protective relay having a make contact, a break contact, and a double-throw contact, for shifting the contact arrangement from self-locking to automatic resetting by means of a piston which can be locked for shifting the make contact and having means for cancelling the self-locking condition by shifting an elastically resilient make contact in the closing direction by the piston which is supported freely movably against a spring force, the improvement comprising means for movably supporting the piston in the direction of resilience of the make contact and means for rotating the piston to lock it in the position for automatic resetting.

**4,315,234**

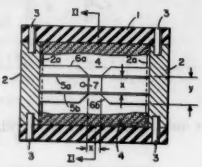
## COMPOSITE FUSIBLE ELEMENT AND ELECTRIC FUSE COMPRISING THE ELEMENT

**Erwin Salzer, P.O. Box 45, Waban, Mass. 02168**

**Filed Jul. 14, 1980, Ser. No. 168,960**

**Int. Cl.³ H01H *85/06, 85/12***

**U.S. Cl. 337—159** **10 Claims**



1. A composite fusible element for electric fuses comprising
(a) a pair of parallel straight drawn wires having a relatively small substantially circular cross-section of a metal having a relatively small melting $i^2$-t;
(b) a pair of plates of sheet metal arranged in the same plane, having a relatively large cross-section, lacking any point of reduced cross-section where arc initiation might occur under short-circuit conditions, and being of a metal having a relatively large melting $i^2$-t; and
(c) an insulating gap separating said pair of plates, said pair of wires extending across said insulating gap and conductively interconnecting said pair of plates.

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**4,315,235**

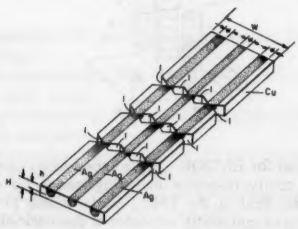
## COMPOSITE FUSIBLE ELEMENT FOR ELECTRIC CURRENT-LIMITING FUSES

**Philip C. Jacobs, Jr., 53 Waldon St., Newtonville, Mass. 02160**

**Filed Jul. 31, 1980, Ser. No. 173,942**

**Int. Cl.³ H01H *85/08, 85/10***

**U.S. Cl. 337—296** **3 Claims**



1. A composite fusible element for current-limiting fuses comprising
(a) an elongated straight strip of silver;
(b) a pair of cooling fins for said strip of silver, said pair of cooling fins being of copper and each being arranged to oppsite sides of said strip of silver;
(c) a pair of juxtaposed incisions in said strip of silver and in said pair of cooling fins entirely severing said pair of cooling fins and extending into said strip of silver to both sides thereof and thereby reducing the cross-section of said strip of silver;
(d) said pair of cooling fins being formed by a unitary strip of copper defining a groove having side walls and bottom walls which are only of copper; and
(e) said strip of silver having the same geometrical configuration as said groove and forming an inlay of said groove resulting in a large heat flow away from said strip of silver

and toward said pair of cooling find when said fusible element is carrying current.

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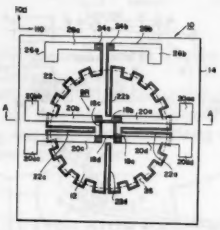
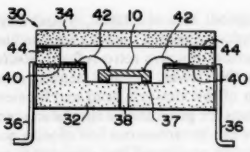
4,315,236

## PRESSURE SENSOR

Tamotsu Tominaga; Teruyoshi Mihara, both of Yokohama; Takeshi Oguro, Yokosuka, and Masami Takeuchi, Kokubunji, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jan. 4, 1980, Ser. No. 109,476
Claims priority, application Japan, Jan. 11, 1979, 54-945
Int. Cl.[3] G01L 1/22
U.S. Cl. 338—4 13 Claims






1. A pressure sensor including a sealed package having an inside space, a semiconductor block, a portion of which is in the form of a diaphragm, said semiconductor block including a circumferential support defining the periphery of said diaphragm and bonded to the inside of said package and a pressure-sensitive element including at least one diffused resistor layer formed in a surface of said diaphragm;

a diaphragm breakage detecting element comprising an electric conductor filament formed integrally in the surface of said diaphragm in an electrically insulated relationship to said at least one diffused resistor layer in a part of said diaphragm subject to a relatively large stress, the conductor filament having substantially the same material strength as the diaphragm, said conductor filament being provided zigzagging back and forth laterally across the boundary between said diaphragm and said circumferential support while following around the boundary;

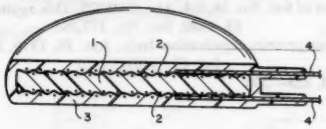
said block with said pressure-sensitive element and said diaphragm breakage detecting element being confined within the inside space of said package and bonded to the inside of said package so that said diaphragm, said pressure-sensitive element and said diaphragm breakage detecting element are positioned spaced from the inside of said package and a hermetically sealed space is defined between the inside of said package and a front side of said block which includes said surface of said diaphragm, said space being adapted to be kept at a predetermined reference pressure, said package having a hole bored therethrough at such a position that a fluid pressure subject to measurement can be introduced into the interior of said package through said hole so as to arrive at a back surface of said diaphragm.

4,315,237

## PTC DEVICES COMPRISING OXYGEN BARRIER LAYERS

Lee M. Middleman, Portola Valley, and Alan J. Gotcher, Saratoga, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 965,345, Dec. 1, 1978, abandoned. This application Nov. 30, 1979, Ser. No. 98,711
Int. Cl.[3] H01C 7/02
U.S. Cl. 338—22 R 29 Claims




1. An electrical device which comprises

(1) a PTC element which is composed of a composition which exhibits PTC behavior with a switching temperature $T_s$ and which comprises

(a) a macromolecular polymer; and

(b) conductive particles dispersed in said polymer;

(2) at least two electrodes which can be connected to a source of electrical power and which, when so connected, cause current to flow through said PTC element; and

(3) an oxygen barrier which, when the device is in air at standard temperature and pressure, restricts access of air to the PTC element so that the rate at which the PTC element absorbs oxygen is less than $10^{-6}$ cc/sec/gram.

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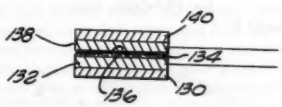
4,315,238

## BOUNCELESS SWITCH APPARATUS

Franklin N. Eventoff, 2351 Lake View Ave., Los Angeles, Calif. 90034

Continuation-in-part of Ser. No. 78,323, Sep. 24, 1979. This application Apr. 16, 1980, Ser. No. 140,921
Int. Cl.[3] H01C 10/10, 10/12
U.S. Cl. 338—99 6 Claims




1. A bounceless switch apparatus having a junction resistance which varies inversely with a pressure applied normally thereto, comprising:

a first conductor member;

a pressure sensitive composition layer including a particulated semiconducting material disposed for covering the first conductor member in intimate electrically conducting contact therewith, the layer pressure sensitive composition layer having a first surface with a multiplicity of microprotrusions of the particulate semiconducting material extending from the first surface for providing a multiplicity of surface contact locations; and

a second conductor member positioned in substantially non-electrically conducting relationship to the pressure sensitive composition layer whereby the bounceless switch apparatus is normally open, the switch being closed in response to a pressing force applied to urge the second conductor member and the first surface together for increasing the physical contact between the microprotrusions and the second conductor, to enable electrical conduction through the contacting microprotrusions, the amount of electrical conduction increasing as the amount

of pressing force is increased and decreasing as the amount of pressing force is decreased.

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4,315,239

## PROCESS FOR PRODUCING A CALIBRATED RESISTANCE ELEMENT AND INTEGRATED CIRCUITRY INCORPORATING SAME

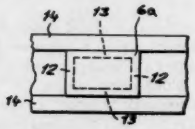
Vincenzo Daniele, Milano; Giuseppe Corda, Saronno; Andrea Ravaglia, Bologna, and Giuseppe Ferla, Milano, all of Italy, assignors to SGS Ates, Componenti Elettronici S.P.A., Milano, Italy

Division of Ser. No. 34,204, Apr. 27, 1979. This application Aug. 13, 1980, Ser. No. 177,595

Claims priority, application Italy, Apr. 28, 1978, 22788A/78

Int. Cl.³ H01C 1/02

U.S. Cl. 338—308 6 Claims




1. Integrated circuitry comprising a substrate covered with a dielectric layer forming a pedestal of greater height, a coating of different material on said pedestal, at least one exposed edge of said pedestal having an undercut of generally semicylindrical shape extending over the entire length thereof, and a filiform resistance element of complementary shape embedded in said undercut while being substantially flush with an overlying edge of said coating.

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4,315,240

## VISUAL DISPLAY APPARATUS

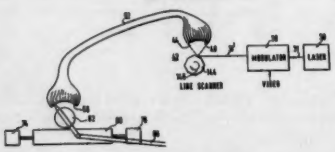
Archer M. Spooner, Orlando, Fla., assignor to Redifon Simulation Ltd., Crawley, England

Filed Jan. 11, 1980, Ser. No. 111,282

Claims priority, application United Kingdom, Jan. 11, 1979, 01009/79; Dec. 21, 1979, 44045/79

Int. Cl.³ G09G 3/02

U.S. Cl. 340—27 R 5 Claims




1. Head-coupled, area-of-interest, visual display apparatus providing stereoscopic viewing for more than one viewer comprising a part-spherical retro-reflective/concave screen of area greater than a viewer's instantaneous field of view and, for each viewer, a helmet, sensing means for sensing the orientation of the respective viewer's head and helmet, visual image generating means for generating a simulated scene in the direction of the respective viewer's instantaneous line of view according to a common simulated vehicle position and orientation and under control of the respective sensing means, the said respective image generating means being adapted for providing a stereoscopic pair of images corresponding to the respective viewer's left eye and right eye views, a laser beam source for producing laser beams, separate laser beam modulators for the left eye and right eye views for modulating said laser beam, separate line scanners for each said view for scanning the modulated laser beams over the input ends of respective fibre optic light guides, the said fibre optic light guides having their output ends at spaced-apart positions on the respective viewer's helmet, and frame scanning means mounted on the said helmet for receiving light from the light guide outputs and projecting the light as a scanned image upon the said screen.

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4,315,241

## VISUAL DISPLAY APPARATUS

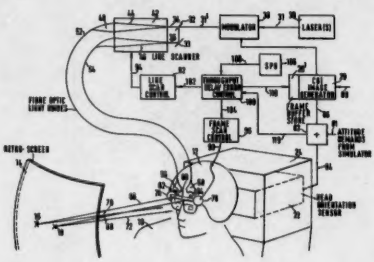
Archer M. Spooner, Orlando, Fla., assignor to Redifon Simulation Limited, Crawley, England

Filed Jan. 11, 1980, Ser. No. 111,283

Claims priority, application United Kingdom, Jan. 11, 1979, 01008/79; Dec. 21, 1979, 44047/79

Int. Cl.³ G09G 3/02

U.S. Cl. 340—27 R 5 Claims




1. Head-coupled, area-of-interest, visual display apparatus providing pseudo-collimated viewing for one viewer, comprising a part-spherical concave retro-reflective screen positioned for viewing by the viewer, a helmet, sensing means for sensing the orientation of the viewer's head and helmet, visual image generating means for generating a simulated scene in the direction of the viewer's instantaneous line of view according to the viewer's simulated positioned and orientation and under control of the said sensing means, a laser light beam source for producing laser beams, a laser beam modulator for modulating said laser beams, optical beam-splitter means for providing identical left eye and right eye views, separate line scanners for each said view for scanning the modulated laser beams over the input ends of more than one fibre optic light guide, the said fibre optic light guides having their output ends at spaced-apart positions on the viewer's helmet, and frame scanning means mounted on the said helmet for receiving light from the light guide outputs and projecting the light as a scanned image upon the said screen.

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4,315,242

## DEVICE FOR DETERMINING THE MOMENT WHEN COMPETITORS IN A RACE ARE PASSING THE FINISHING LINE

Heinz Lueg; Hanno Blackert; Dirk Wimmenauer, all of Aachen, Fed. Rep. of Germany, and Winfried Hermanns, Lütticherstr. 181, D-5100 Aachen, Fed. Rep. of Germany, assignors to Winfried Hermanns, Aachen, Fed. Rep. of Germany

Filed Mar. 25, 1980, Ser. No. 133,838

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1979, 2914137

Int. Cl.³ G08C 21/00; G08G 1/01

U.S. Cl. 340—38 L 9 Claims

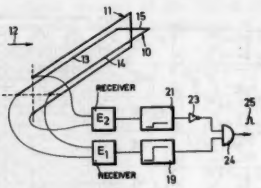
7. A system for determining the moment when competitors in a race pass the finish line, each competitor being fitted with a transmitter, said system comprising:

two receiving antennas arranged as the finish line so that the directional sensitivity of the first antenna is substantially vertical and the directional sensitivity of the second antenna is substantially horizontal,

first and second receivers connected to the respective first and second antennas,

first threshold means, connected to said first receiver, for producing a first output signal when the signal picked up by said first antenna exceeds a first relatively high threshold value,

second threshold means, connected to said second receiver, for producing a second output signal when the signal




picked up by said second antenna is below a second relatively low threshold value, and

logical combining means for producing a single output pulse only when said first and second output signals occur concurrently, said output pulse indicating that a competitor has crossed the finish line.

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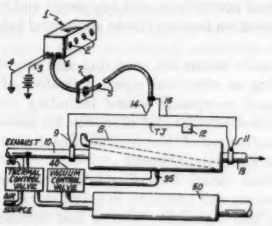
**4,315,243**

## UNUSED FUEL INDICATOR FOR AUTOMOTIVE ENGINES EMPLOYING CATALYTIC CONVERTERS

**Willard R. Calvert, Sr., 809 Teakwood Dr., Severna Park, Md. 21146**

**Filed Sep. 16, 1980, Ser. No. 187,485**
**Int. Cl.³ B60Q *1/00*; G01K *7/04, 17/08***
**U.S. Cl. 340—52 R** **12 Claims**




1. An unused fuel indicator for indicating the operating condition of an automobile engine emission control system employing a catalytic converter while the engine is running, said unused fuel indicator comprising:

(a) converter inlet temperature sensing means for effectively sensing the temperature of the engine exhaust gases supplied to the inlet of the catalytic converter and deriving an inlet temperature electric signal representative of the inlet exhaust gas temperature;

(b) converter outlet temperature sensing means for effectively sensing the temperature of the exhaust gases emitted from the outlet of the catalytic converter and deriving an outlet temperature electric signal representative of the converter outlet exhaust gas temperature;

(c) means for differentially processing said inlet and outlet temperature electric signals and deriving therefrom a temperature difference electric signal representative of the difference between the inlet and outlet temperatures of the exhaust gases being processed by the catalytic converter;

(d) electronic processing circuit means supplied with said temperature difference electric signal for processing said temperature difference electric signal to derive different value temperature indicating electric signals representative of different operating temperature ranges for the difference temperature between the inlet and outlet temperatures of the catalytic converter for both normal and abnormal operating conditions; and

(e) indicator means responsive to said different value temperature indicating electric signals for indicating the operating condition of the automobile engine emission control system during operation.

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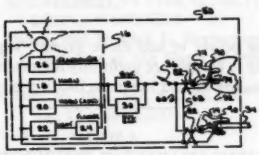
**4,315,244**

## VEHICLE ALARMS

**Loren F. Cole, Jr., 5310 NE. 67th St., Seattle, Wash. 98115**

**Filed Aug. 17, 1979, Ser. No. 67,215**
**Int. Cl.³ B60R *25/10***
**U.S. Cl. 340—63** **1 Claim**



1. An alarm circut for alerting the user and others to the in-process theft of a motorcycle, said alarm comprising:

a battery for supplying current in the alarm circut; and alarming means powered by said battery and controlled by an alarm circut switch for notifying the user and others of an in-process motorcycle theft;

said alarm circut switch for attachment to a tire of said motorcycle, said circut switch having a first electrically conductive jaw which is spring biased to close upon a second jaw in response to rotation of said tire due to in-process motorcycle theft and;

a first wire fixed to said second jaw such that the closing of said electrically conductive first jaw upon said second jaw causes an electrically conductive pathway to be created through said first jaw and said first wire;

a second wire fixed to said electrically conductive first jaw such that a closing of said first jaw upon said second jaw causes an electrically conductive pathway to be created through said second wire, first jaw and thence through said first wire such that when said first and second jaws are closed the alarm circut switch is closed and the alarming means is empowered by the battery and when said first and second jaws of said switch are grasping the tire of said motorcycle and the tread is interposed between said first and second jaw, the alarm circut remains open;

an extension of said first and second wires from said respective second and first jaws to an anchoring means on said motorcycle frame with the length of said extension permitting a limit but definite movement of the motorcycle prior to detachment of said alarm circut switch and a closing of said alarm circut switch.

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**4,315,245**

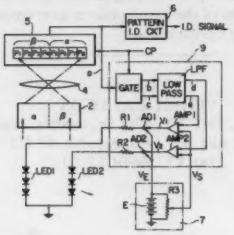
## OPTICAL INFORMATION READING DEVICE

**Tsuneo Nakahara; Kenichi Yoshida; Koichi Tsuno, and Isao Isshiki, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Filed Apr. 5, 1979, Ser. No. 27,416**
**Claims priority, application Japan, Apr. 5, 1978, 53/40011**
**Int. Cl.³ G06K *9/22***
**U.S. Cl. 340—146.3 AG** **14 Claims**

1. An optical information reading device comprising; a source of electrical power, a light source actuated by said power source and comprising a plurality of luminous diodes, a sensor means for reading signals comprising an array of photoelectric conversion elements, means for processing the signals read by said sensor means, said plurality of luminous diodes

divided into a plurality of luminous diode groups, and, means receiving the output of said sensor means and selectively con-




trolling the power to said diode groups, whereby characters and the like to be read are uniformly illuminated by controlling the illumination of said luminous diode groups.

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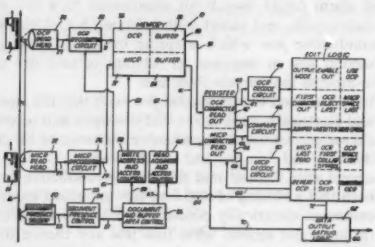
**4,315,246**

## DOCUMENT CHARACTER RECOGNITION SYSTEM FOR IDENTIFYING MAGNETIC INK CHARACTERS ON BANK CHECKS AND THE LIKE

**Richard E. Milford, Oklahoma City, Okla., assignor to Magnetic Pheripherals, Inc., Oklahoma City, Okla.**

**Filed Jul. 11, 1979, Ser. No. 56,720**
**Int. Cl.³ G06K *9/00***
**U.S. Cl. 340—146.3 D** **6 Claims**




1. A character recognition system for selectively reading and identifying a plurality of characters printed in magnetic ink on documents, the documents being bank checks and the like, the documents transported on a document transport mechanism, the system comprising:

a magnetic ink character recognition, i.e. MICR read head and recognition circuit disposed adjacent the document transport mechanism for reading the magnetic ink characters on the document and providing a character recognition code for each character read;

an optical character recognition, i.e. OCR read head and recognition circuit disposed adjacent the document transport mechanism and positioned at a fixed distance downstream from the MICR read head, the OCR read head and circuit optically reading the magnetic ink characters on the document and providing a character recognition code for each character read;

a memory having write and read access control with document and buffer area control connected to the MICR and OCR circuitry, the memory having the capacity to store all of the OCR and MICR character recognition codes for a single document; and

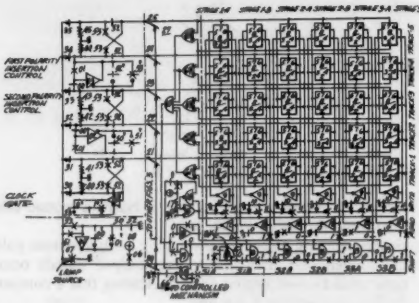
edit logic connected to the memory for comparing corresponding character codes from the memory and putting out a final character code or skipping and repeating character codes to achieve a character correspondence.

**4,315,247**

## SECURITY SYSTEMS EMPLOYING AN ELECTRONIC LOCK AND KEY APPARATUS

**Charles E. Germanton, 38 Mountain Ave., Summit, N.J. 07901**

**Filed Aug. 13, 1979, Ser. No. 65,769**
**Int. Cl.³ H04Q *9/00***
**U.S. Cl. 235—382** **9 Claims**



1. An electronic lock and key system for activating a control mechanism to permit entry to a secured area, comprising:

(a) key means having located thereon a selected one of a plurality of unique digital codes, said key means having said selected code impressed thereon with selected bits of said code arranged in a plurality of information bearing tracks, said key means further including a clock track having a predetermined number of bits located thereon and indicative of a storage sequence, with said clock track positioned centrally on said key means and having number of information bearing tracks above and below said clock track,

(b) receptacle means for receiving said key means and for providing an electrical signal indicative of said selected code, said receptacle means including clock detecting means responsive to said clock bits for providing a timing signal indicative of the position of each bit in each of said information bearing tracks,

(c) processor means including a memory coupled to said clock means and operative in a first storage mode responsive to said signal for storing said selected code upon insertion of said key means in said receptacle during said first mode in predetermined locations according to said clock bits and operative in a second mode responsive to said timing signal for comparing each bit as stored in said location only during the clock bit indicative of the position of that bit as stored for thereafter comparing said selected code as manifested by said electrical signal with said code as stored to provide a comparison between the same, and

(d) means providing a signal for activating said control mechanism upon a favorable comparison.

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**4,315,248**

## LOAD CONTROL SYSTEM FOR STANDARD ELECTRIC UTILITY METER

**Steven M. Ward, El Paso, Tex., assignor to Energy Optics, Inc., Las Cruces, N. Mex.**

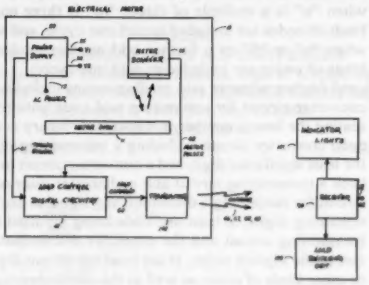
**Filed Feb. 21, 1980, Ser. No. 123,217**
**Int. Cl.³ H04G *9/00*; G01K *11/64***
**U.S. Cl. 340—825.72** **15 Claims**

1. An automatic load control system for electric utility meter connected to a primary power source, comprising, in combination:

first means to convert the primary power available from said utility meter into digital timing pulses and a source of secondary power for load control subsystems;

second means deriving power from said secondary source and effective to monitor primary power consumption and to generate a plurality of digital meter pulses with each pulse representing a predetermined quantity of said primary electric power consumed;

third means comprising a digital circuit accepting said timing pulses and secondary power from said first means and digital meter pulses from said second means effective to determine a digital measure of the rate at which meter pulses are generated and on comparison of said digital



measure to a pre-set digital threshold to generate a digital load control command signal when said threshold is exceeded, said signal having a preselected frequency code;

fourth means comprising wireless data carrier link transmitter effective to transmit said load command signal generated by said third means to a remote control point; and,

fifth means comprising a wireless receiver having one or more switching units located at said remote control point responsive to the frequency code of said load commands transmitted over said data link of said fourth means to provide one or more preselected switching functions.

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**4,315,249**

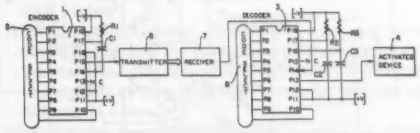
## DATA COMMUNICATION SYSTEM FOR ACTIVATING REMOTE LOADS

**William C. Apple, Brighton, and Keith D. Jacob, Ann Arbor, both of Mich., assignors to Multi-Elmac Company, Novi, Mich.**

**Continuation-in-part of Ser. No. 15,495, Feb. 26, 1979. This application Apr. 14, 1980, Ser. No. 140,044**

**Int. Cl.³ H04Q *9/00***

**U.S. Cl. 340—825.52** **12 Claims**



1. A data communication system for remotely activating a plurality of loads, said system comprising:

transmitter means having an encoder with first and second sets of inputs, operative to provide a multi-bit pulse train for transmission to a receiver, selected bits of said pulse train being associated with the first set of encoder inputs and defining an address code, with other bits of the pulse train being associated with said second set of encoder inputs and defining data;

receiver means having a decoder coupled for receipt of the pulse train from the transmitter, a set of code select inputs for the decoder defining a local address code for the receiver, generator means for providing a local pulse train as a function of the code select inputs, comparison means having inputs coupled for receipt of the local pulse train and the transmitted pulse train for making a sequential pulse-by-pulse comparison therebetween, disabling means having an input coupled for receipt of the transmitted pulse train and an output coupled to said comparison means, operative for selectively disabling the comparison means from comparing the data bits in the transmitted pulse train with corresponding bit positions in the local pulse train; and

activator means for energizing selected loads according to the states of the data bits in the transmitted pulse train if the address code portions of the local and transmitted pulse train match.

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**4,315,250**

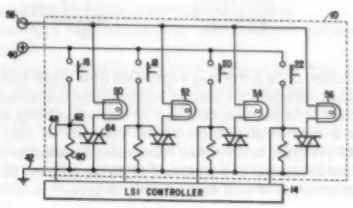
## CONNECTION ARRANGEMENT FOR SELECTION AND DISPLAY SYSTEM

**John W. Wurst, Dover, and Howard L. Beckerman, Middletown, both of N.J., assignors to The Singer Company, Stamford, Conn.**

**Filed Dec. 10, 1979, Ser. No. 102,289**

**Int. Cl.³ G08B *5/00***

**U.S. Cl. 340—286 R** **5 Claims**




1. In a system of the type having an operator actuable switching element, an indicating element having a control input associated with said switching element and a controller responsive to actuation of said switching element for performing a function associated with said switching element and for controlling the energization of said indicating element, an arrangement for utilizing only a single lead connected to said controller for the pair of switching and indicating elements for signalling the controller when said switching element is actuated and for controlling the subsequent energization of the associated indicating element, said arrangement comprising:

first means for connecting a first side of said switching element to a first level of potential;

second means for connecting a first side of said indicating element to a second potential level; and

third means for connecting the second side of said switching element and the control input of said indicating element to said single lead.

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**4,315,251**

## AUTOMATIC METER READING AND CONTROL SYSTEM

**Paul B. Robinson, Durham, N.H.; Maurice J. Ouellette, North Berwick, Me., and Larry A. Schmidt, Rochester, N.H., assignors to General Electric Company, Somersworth, N.H.**

**Filed Mar. 31, 1980, Ser. No. 135,860**

**Int. Cl.³ H04B *3/54***

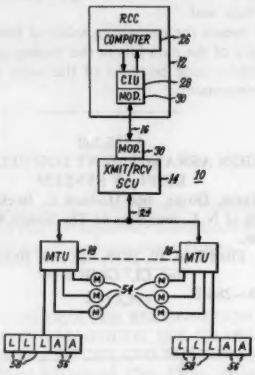
**U.S. Cl. 340—310 A** **22 Claims**

1. A remote automatic utility monitoring and control system including a terminal unit connected to a power line, said terminal unit comprising:

(a) means for receiving a command over said power line, said command including an action field portion and a function code portion; and

(b) decode means responsive to said received command to

effect the immediate execution of the functions as specified by said function code portion when said decode means recognizes a first address type contained in said action field portion and further recognizes an address assigned to said terminal unit as specified by at least a portion of the contents of the first address type; and to effect the execution of the functions as specified by said




function code portion at a specified time when said decode means recognizes a second address type contained in said action field portion, said time of execution being specified by a time field portion of the contents of said second address type, and further recognizes an address assigned to said terminal unit as specified by an address portion of the contents of said second address type.

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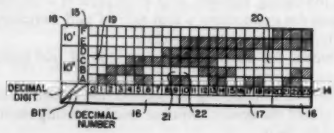
**4,315,252**

## APPARATUS FOR DETECTING THE RELATIVE POSITION OF TWO MOVABLE BODIES

**Ichizo Tagami, Hachioji, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Continuation-in-part of Ser. No. 826,666, Aug. 22, 1977. This application Dec. 20, 1979, Ser. No. 105,646**
**Claims priority, application Japan, Aug. 23, 1976, 51/100367**
**Int. Cl.³ H03K** *13/02, 13/18*
**U.S. Cl. 340—347 P** **2 Claims**




1. In an apparatus for detecting the relative position or displacement between two movable bodies of the type wherein a code pattern representing the relative position or displacement between said two movable bodies is marked on one of said two movable bodies in the direction of movement or displacement, and a reading means is mounted on the other movable body for reading said code pattern on said one movable body, the improvement

(a) wherein said code pattern on said one movable body represents numeric words of base-n number (where $n \geqq 2$), the characters corresponding to each order of base-n number being represented by binary numerals;

(b) wherein said characters comprise elements of each one code of "m" codes in one cycle, (where "m" is an aliquot part or submultiple of "n") one or more of said cycles being arranged in a chain or in a link corresponding to the respective order of base-n number except the highest order represented by another code, all of said codes being characterized in that the characters representative of successive numbers in each code are arranged to differ in only one binary number;

(c) wherein between the consecutive codes in each order of base-n numbers, the state of binary numerals representing the character "n-1" in the preceding code is the same with the state of binary numerals representing the character "0" in the succeeding code; and

(d) wherein when "n" is an even number, "m" is two, and two kinds of codes are included in said one cycle, wherein when "n" is a multiple of three, "m" is three and three kinds of codes are included in said one cycle, and wherein when "n" is "5" or a further odd number, at least four kinds of codes are included in said one cycle;

(e) and further wherein said reading means includes a code converter circuit for converting said code pattern representing the base-n number into a suitable binary code, said code converter circuit including a transmitting circuit at the least significant digit, and a convertor circuit including both a transmitting circuit and a character discriminating circuit for outputting a discriminating signal at each of the remaining digits, at least one code being inputted into the transmitting circuit and the character discriminating circuit at the highest order, at the least significant digit three or more kinds of codes as well as the discriminating signal from a respective preceding digit being inputted into the transmitting circuit, while at each of the remaining digits three or more kinds of codes as well as the discriminating signal from a respective preceding digit are inputted into the transmitting circuit and the character discriminating circuit, respectively, whereby the relative position or displacement between said two movable bodies may be represented by said binary coded base-n number.

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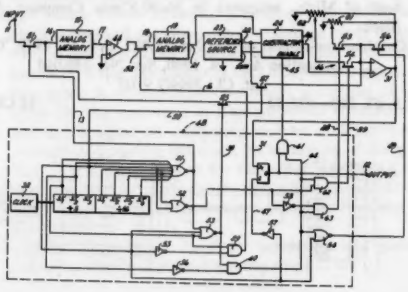
**4,315,253**

## ERROR CORRECTION IN RECIRCULATING REMAINDER ANALOG-TO-DIGITAL CONVERTERS

**Hulbert T. Tytus, 6714 Maple St., Cincinnati, Ohio 45227**

**Division of Ser. No. 10,173, Feb. 7, 1979, abandoned. This application Oct. 15, 1979, Ser. No. 84,767**
**Int. Cl.³ H03K** *13/09*
**U.S. Cl. 340—347 CC** **21 Claims**




1. In a recirculating remainder converter for converting an analog signal into a digitally encoded signal, said converter including two analog memories for sampling and storing analog signals related to a voltage to be converted, means for comparing said stored signals with a reference signal, means responsive to said comparison for providing a code bit, means responsive to said comparison for producing a remainder signal, means for amplifying said remainder signal, means for recirculating said amplified remainder signal to one of said analog memories, the improvement in said converter, comprising:

error nulling means including inverting means for inverting the polarity of the recirculated signal, the polarity of said

signal being inverted an even number of times between successive comparisons.

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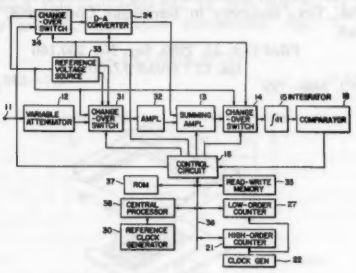
**4,315,254**

## SELF-COMPENSATING A-D CONVERTER

**Jun Honjyo, and Yukimitsu Watanabe, both of Gyoda, Japan, assignors to Takeda Riken Kogyo Kabushiki Kaisha, Japan**

**Filed Jan. 11, 1980, Ser. No. 111,303**
**Int. Cl.³ H03K *13/02***
**U.S. Cl. 340—347 CC** **9 Claims**




1. An A-D converter comprising:

means for providing an input analog signal;

first A-D converting means for converting the input analog signal to a first digital signal to obtain a highorder digit output;

A-D converting means, operatively connected to said first A-D converting means, for re-converting the first digital signal to an analog signal;

amplifying means, operatively connected to said D-A converting means, for amplifying the difference between the reconverted analog signal and the input analog signal;

second A-D converting means, operatively connected to said amplifying means, for converting the amplified difference signal to a second digital signal to obtain a low-order digit output;

reference voltage means, operatively connected to said amplifying means, for providing a reference voltage for the converted output available from said D-A converting means when an input is applied thereto for each one of its bits, one at a time;

control means, operatively connected to said D-A converting means, said reference voltage means and said second A-D converting means, for determining the difference between the converted output from the D-A converting means, when the input thereto is applied for each bit, and the corresponding reference voltage from the reference voltage means, said second A-D converting means converting the difference to a third digital signal to obtain an error signal for each bit of said D-A converting means;

memory means, operatively connected to said second A-D converting means, for storing the third digital signal corresponding to the error signal; and

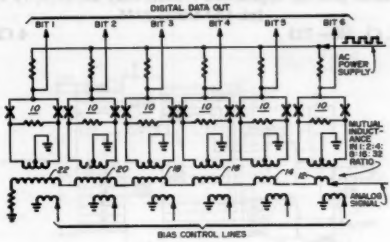
calculating means, operatively connected to said memory means, for performing a corrective calculation for the low-order digit output using the error signal.

**4,315,255**

## MULTIPLE-QUANTUM INTERFERENCE SUPERCONDUCTING ANALOG-TO-DIGITAL CONVERTER

**Richard E. Harris, and Clark A. Hamilton, both of Boulder, Colo., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Oct. 27, 1980, Ser. No. 201,669**
**Int. Cl.³ H03K *13/02***
**U.S. Cl. 340—347 AD** **3 Claims**




1. An analog-to-digital converter comprising:

a plurality of superconducting inteferometers connected in parallel,

each of said interferometers comprising at least two Josephson junctions connected in a superconducting loop,

circuit means for coupling an analog signal as the control current to each of said interferometers with factor of two changes in coupling to each successive interferometer,

each of said interferometers having an inductance means for coupling the input analog signal to said interferometers, and

circuit means for connecting a gating voltage across said parallel connected interferometers for biasing all of said interferometers, whereby each interferometer for which the bias level exceeds its threshold level will switch from a zero voltage to a voltage state producing an output pulse.

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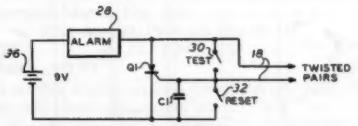
**4,315,256**

## CHIMNEY FIRE DETECTOR

**John R. Dennis, P.O. Box 396, Milford, Pa. 18337**

**Filed Jan. 28, 1980, Ser. No. 116,002**
**Int. Cl.³ G08B *17/06***
**U.S. Cl. 340—590** **7 Claims**




1. A chimney fire detector comprising:

an outer pair of twisted wires having an outer portion mounted at the outlet of said chimney;

a lead pair of twisted wires connected to said outer pair of twisted wires;

sensing means connected with said lead pair of twisted wires for detecting electrical contact between said lead pair of twisted wires or between said outer pair of twisted wires;

an outer insulator mounted between said outer pair of twisted wires; and

a lead insulator mounted between said lead pair of twisted wires, said outer and lead insulators allowing said outer and lead pairs of twisted wires, respectively to contact

electrically in response to temperatures in excess of different predetermined temperatures.

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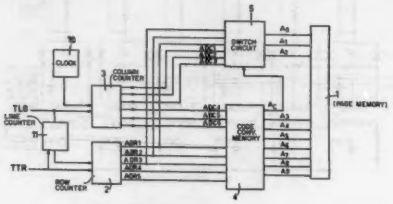
**4,315,257**

## METHOD AND DEVICE FOR ADDRESSING A PAGE MEMORY IN A VIDEOTEX SYSTEM

**Charles Hernandez, Villejuif, France, assignor to Telediffusion de France & Compagnie Continentale de Signalisation, Paris, France**

**Filed May 22, 1980, Ser. No. 152,497**
**Claims priority, application France, May 23, 1979, 79 13240**
**Int. Cl.³ G09G *1/16***
**U.S. Cl. 340—723** **4 Claims**




1. A method for addressing a page memory in a videotex system, said page memory being capable of storing the character data required for displaying one page of text, each page comprising 25 rows of 40 characters each, the first row being a service row, said memory having 1024 available positions, wherein the 24 positions not dedicated to character data are respectively allocated to the 24 rows other than the first row for reading out data common to all the characters of the row in consideration.

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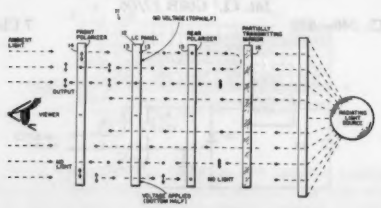
**4,315,258**

## TRANSMISSIVE AND REFLECTIVE LIQUID CRYSTAL DISPLAY

**William H. McKnight, San Diego; Larry B. Stotts, Chula Vista, and Michael A. Monahan, Poway, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Feb. 15, 1980, Ser. No. 121,948**
**Int. Cl.³ G09G *3/36***
**U.S. Cl. 340—784** **2 Claims**




1. An apparatus having the capability for providing a visual display in the transflective mode comprising:
- means for providing a source of ambient light;
- means for radiating light through a predetermined volume;
- a nematic liquid crystal interposed between the ambient light providing means and the light radiating means in the predetermined volume for selectively rotating the polarization axis of transmitted and reflected light therethrough in select areas thereof in response to applied potentials to create relatively bright areas to a viewer located in the ambient light area when an applied potential is impressed thereacross;
- first means disposed between the ambient light providing means and the nematic liquid crystal for polarizing the ambient light into a single linearly polarized component;
- second means disposed between the light radiating means and the nematic liquid crystal for polarizing the radiated light into a single component, the first polarizing means and the second polarizing means being a pair of linear polarizers disposed in a parallel orientation; and
- a "one way" mirror, partially transmissive and interposed between the second polarizing means and the light radiating means for partially transmitting portions of the radiated light and specularly reflecting portions of the ambient light, the twisted nematic liquid crystal creating relatively bright areas to a viewer located in the ambient light area when an applied potential is impressed thereacross whereby the contrast of the visual display is enhanced and washout is reduced.

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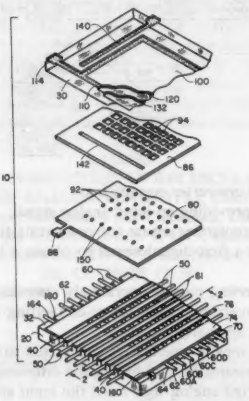
**4,315,259**

## SYSTEM FOR OPERATING A DISPLAY PANEL HAVING MEMORY

**Joseph E. McKee, Annandale, N.J., and James Y. Lee, Sugar Land, Tex., assignors to Burroughs Corporation, Detroit, Mich.**

**Filed Oct. 24, 1980, Ser. No. 200,160**
**Int. Cl.³ H05B *37/00***
**U.S. Cl. 340—799** **4 Claims**




1. A system for operating a display panel with memory wherein the display panel includes
- a gas-filled envelope,
- a first layer of D.C. scan cells disposed in rows and columns and including row scan anodes and column scan cathodes which cross each other, with the crossings defining said D.C. cells,
- an apertured electrode defining rows and columns of display cells, each display cell being in communication with a D.C. scan cell, and
- an A.C. electrode associated with and insulated from said apertured electrode and operating therewith as the electrodes for said display cells,

said system comprising
- first means coupled to all of said scan anodes for applying operating potential thereto,
- second means coupled to said scan cathodes for applying operating potential to each cathode in turn to fire and turn on each column of scan cells in turn sequentially,
- third means coupled to said scan anodes for applying data signals to selected ones of said anodes as its column of scan cells is fired and turned on, and
- fourth means coupled to said apertured electrode and said A.C. electrode for applying sustainer signals thereto, the

application of said sustainer signals and said data signals being synchronized so that, when the data signals are applied, glow is generated in the selected display cells associated with the scan anodes to which the data signals are applied, the sustainer signals sustaining the display glow in such selected display cells,

said fourth means comprising an electronic circuit including means generating a sustainer signal including positive and negative pulses generated about a positive reference voltage level, said means including a diode bridge and a plurality of semiconductor switches coupled thereto so as to provide said sustainer signal as each semiconductor switch is turned on in an operating sequence.

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## 4,315,260
## METHOD AND APPARATUS FOR MEASURING THE DISTANCE BETWEEN A PRIMARY STATION AND A SECONDARY STATION

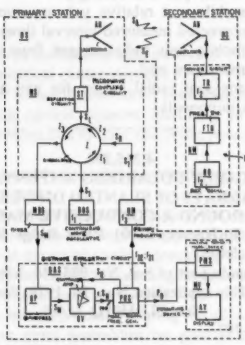
**Hanspeter Küpfer, Uitikon, Switzerland, assignor to Siemens-Albis Aktiengesellschaft, Zürich, Switzerland**

**Continuation-in-part of Ser. No. 888,024, Mar. 20, 1978, abandoned. This application Sep. 10, 1979, Ser. No. 74,234**

**Claims priority, application Switzerland, Apr. 7, 1977, 4433/77**

**Int. Cl.³ G01S *13/32***

**U.S. Cl. 343—7.5** **17 Claims**




3. A circuit for measuring the distance between a primary station and a secondary station, comprising:

a respective antenna provided for each

said primary station and secondary station;

said primary station containing:

a microwave coupling circuit;

a primary modulator and a mixer connected with said microwave coupling circuit;

a distance evaluation circuit;

said mixer being connected with said distance evaluation circuit;

said distance evaluation circuit including a measuring signal frequency generator having a first output side and a second output side;

a measuring device;

said measuring signal frequency generator being connected at its first output side with said primary modulator and at its second output side with said measuring device;

said measuring frequency signal generator including a controlled oscillator which modulates and controls the frequency of the measuring signal so as to assume a mean value;

said distance evaluation circuit further including a bandpass filter;

said measuring signal frequency generator having an input side;

said input side of said measuring signal frequency generator being connected by means of said bandpass filter with said mixer.

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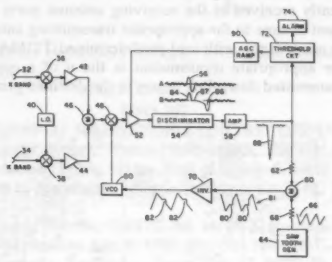
## 4,315,261
## RADAR SIGNAL DETECTOR

**Richard K. Mosher, Sudbury, Mass., assignor to Controlonics Corporation, Littleton, Mass.**

**Filed Jun. 3, 1980, Ser. No. 156,102**

**Int. Cl.³ G01S *7/28, 7/36***

**U.S. Cl. 343—18 E** **9 Claims**




1. A radar signal detector comprising:

means for receiving an incoming radar signal at a frequency within a range of frequencies;

means for generating a frequency swept signal at a predetermined sweep rate;

means for multiplying the signal from the receiving means with said frequency swept signal to produce a difference signal;

narrow band descriminator means responsive to said difference signal and operative to provide FM demodulation thereof;

an amplifier coupled to the demodulated output of said descriminator means; and,

means responsive to the output of said amplifier for reducing the sweep rate of said frequency swept signal generating means; and,

means for providing an indication of a received signal in response to a predetermined output of said amplifier.

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## 4,315,262
## SATELLITE COMMUNICATION SYSTEM WITH A PLURALITY OF LIMITED SCAN SPOT BEAMS

**Anthony Acampora, Freehold, and Douglas O. Reudink, Sea Girt, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Apr. 26, 1979, Ser. No. 33,735**

**Int. Cl.³ H04B *7/00***

**U.S. Cl. 343—100 ST** **6 Claims**

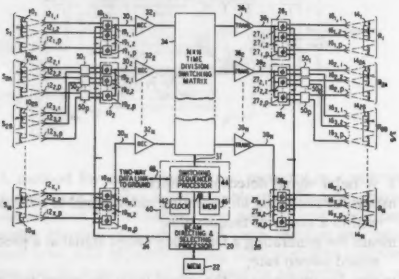
1. In a satellite communication system, an on-board satellite switching subsystem comprising:

a plurality of x scannable receiving antenna ports ($12_1$–$12_X$), each receiving antenna port being associated with a separate one of x possible up-link beams ($10_1$–$10_N$) and only n of x beams are concurrently receivable at any instant of time, where $n \leqq x$, each up-link beam being capable of propagating bursts of information in a predetermined time division multiple access (TDMA) sequence during a system frame period from a predetermined number of a plurality of m spaced-apart ground areas forming an overall system service region to the associated scannable receiving antenna port, where $n \leqq m$ and different traffic demands exist between each of the pairs of the m ground areas;

a plurality of x scannable transmitting antenna ports ($16_1$–$16_x$), each transmitting antenna port being capable of

forming a separate scannable down-link spot beam and the x scannable transmitting antenna ports are capable of transmitting the bursts of information concurrently received at the n of x scannable receiving antenna ports at any instant of time toward the destined ground areas in appropriate n of x concurrently transmitted down-link beams in accordance with said predetermined TDMA sequence; and

switching means (34) disposed between the plurality of x scannable receiving antenna ports and the plurality of x scannable transmitting antenna ports and capable of selectively transferring the n bursts of information concurrently received at the receiving antenna ports at any instant of time to the appropriate transmitting antenna ports in accordance with said predetermined TDMA sequence for appropriate transmission in the n of x concurrently transmitted down-link beams to the destined ground areas;




characterized in that

the x antenna ports of each of the plurality of scannable receiving and transmitting antenna ports are each scannable over only a separate limited portion of the plurality of m ground areas forming the overall system service region and are formed into n groups of one or more antenna ports, each group of receiving and transmitting antenna ports being associated with a separate one of the n concurrently received and transmitted beams, respectively, in a manner so that each group of receiving and transmitting antenna ports handles the traffic requirements of a separate one of n limited non-interfering transmitting communication zones ($S_1$–$S_N$) and n limited non-interfering receiving communication zones ($R_1$–$R_N$), respectively, and each of said limited non-interfering transmitting and receiving communication zones comprises a substantially equal traffic requirement.

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**4,315,263**

## NAVIGATIONAL SYSTEMS USING PHASE ENCODED ANGULAR COORDINATES

**Norman S. Neidell, 13054 Taylorcrest, Houston, Tex. 77079**

**Continuation of Ser. No. 925,903, Jul. 19, 1978, which is a continuation-in-part of Ser. No. 691,674, Jun. 1, 1976, Pat. No. 4,114,153, which is a continuation of Ser. No. 483,202, Jun. 26, 1974, abandoned. This application Sep. 18, 1979, Ser. No. 76,695**

**Int. Cl.³ G01S *3/02***

**U.S. Cl. 343—112 C** **18 Claims**

1. In a method of ascertaining for at least one mobile unit, navigational information in terms of at least one angular coordinate, radial ranges, and relative velocity components, by transmitting from at least one transmitter and receiving with at least on receiver, at least one component signal in a medium of known propagation velocity, characterized by:

forming each said component signal to consist of at least one member signal, all said component signals being separable;

phase encoding in at least one said member signal a distinction in phase according to at least one angular coordinate;

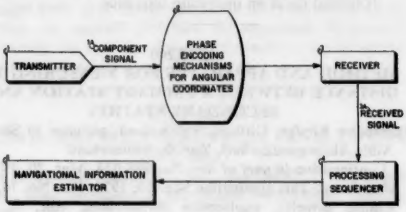
receiving said component signals, separating them, and identifying within each said component signal each individual member signal;

measuring phases for each one of said identified member signals;

decoding each said angular coordinate from said measured phases and said encodings produced by said encoding step;

measuring signal transit times for any member signal having a known time of initiation;

measuring interval times between member signals for any member signals whose interval time is initially known;




forming corrected measured signal transit times and interval times by compensating each so formed time for any linear elements in said phase encodings;

producing mobile unit relative velocity components from any said corrected measured interval times;

producing mobile unit radial ranges from any corrected signal transit times, and

correcting any said radial ranges for any known relative velocity components.

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**4,315,264**

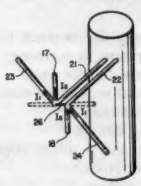
## CIRCULARLY POLARIZED ANTENNA WITH CIRCULAR ARRAYS OF SLANTED DIPOLES MOUNTED AROUND A CONDUCTIVE MAST

**Raymond H. DuHamel, 12001 Rhus Ridge Rd., Los Altos Hills, Calif. 94022**

**Continuation-in-part of Ser. No. 885,444, Mar. 10, 1978, abandoned. This application Nov. 16, 1979, Ser. No. 95,051**

**Int. Cl.³ H01Q *21/26***

**U.S. Cl. 343—797** **8 Claims**




1. A circularly polarized antenna comprising an elongated support having a conductive outer surface; at least one circular array of radiating elements where the number of radiating elements N is at least three, each of said radiating elements comprising a long dipole at a slant angle with respect to a plane perpendicular to the elongated support and said plane passing through the mid points of said long dipoles and a short dipole connected to said long dipole and fed in parallel with said long dipole and disposed at an angle with respect to the long dipole, said short dipole having a length substantially less than one-half wavelength at the operating freqency and said long dipole having a length of approximately one-half wavelength at the operating frequency; said long dipole and said short dipole each comprising first and second sections extending away from said plane and first and second support means extending outwardly from said support and engaging the ends of said first and second sections respectively at said plane and means for

feeding the supported ends of said radiating elements in each circular array with voltages of equal amplitude and progressive phase shift of $2\rho M/N$ radians where M is the mode number.

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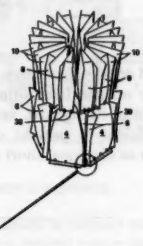
**4,315,265**

## RIGID COLLAPSIBLE DISH STRUCTURE

**William B. Palmer, Palos Verdes Estates, and Martin M. Giebler, Redondo Beach, both of Calif., assignors to TRW Inc., Cleveland, Ohio**

**Filed Jun. 11, 1980, Ser. No. 158,412**
**Int. Cl.³ H01Q *15/20***
**U.S. Cl. 343—840** **13 Claims**



1. An improved collapsible dish structure comprising:
a rigid symmetrical center support;
a plurality of concentric rows of petal assemblies arranged around said central support, including an inner row of petal assemblies and at least one outer row of petal assemblies;
each petal assembly containing a rigid center petal and two rigid side petals;
a first hinge means pivotally joining the center and side petals on hinge axes along the adjacent petal edges;
a second hinge means pivotally connecting said center petals to said support on pivot axes tangent to concentric circles about the axis of said support;
a third hinge means pivotally joining the adjacent side petals of adjacent petal assemblies on pivotal axes along the adjacent longitudinal edges of the adjacent said petals;
said petals being deployable outwardly about their hinge axes to deployed positions;
said petals being rotatable inwardly about their hinge axes from said deployed positions to folded positions wherein the adjacent side petals extend inwardly from and in transverse relation to their respective center petals and in face to face relation to one another and the petals are contained within a cylindrical envelope having a ratio of diameter deployed to diameter collapsed of 3.4 or better.

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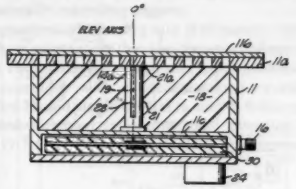
**4,315,266**

## SPIRAL SLOTTED PHASED ANTENNA ARRAY

**Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Haynes Ellis, Jr., Chino, Calif.**

**Filed Jul. 25, 1980, Ser. No. 172,099**
**Int. Cl.³ H01Q *1/36***
**U.S. Cl. 343—895** **10 Claims**

1. A cavity-backed, flush-mountable antenna comprising: a conductive-walled cavity of generally elliptical cross-section and having a substantially elliptical aperture plate constituting one face thereof, said cavity being of substantially uniform depth measured normal to said aperture plate; first and second radiator slot pairs cut through the thickness of said aperture plate, the slots of said pairs spiralling in the same rotation sense from corresponding first and second slot center points adjacent on either side of the center of said aperture plate; and slot feed means for separately feeding said first and second slot center



points to effect electrically mutually orthogonal operation of said slot pairs.

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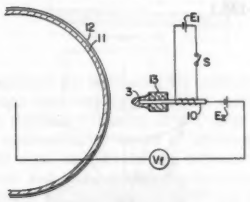
**4,315,267**

## METHOD OF MAGNETOFLUIDIC RECORDING

**Nobuo Sonoda, Settsu; Wataru Shimotsuma, Ibaraki; Yoshio Kishimoto, and Yoichi Sekine, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 924,872, Jul. 14, 1978, abandoned. This application Apr. 9, 1980, Ser. No. 138,682**
**Claims priority, application Japan, Jul. 22, 1977, 52/88712; Dec. 13, 1977, 52/150214; Dec. 19, 1977, 52/153233; Dec. 19, 1977, 52/153234; Dec. 19, 1977, 52/153235; Apr. 13, 1978, 53/43981; Apr. 13, 1978, 53/43982; Apr. 13, 1978, 53/43983**
**Int. Cl.³ G01D *15/16***
**U.S. Cl. 346—1.1** **20 Claims**



1. A method for nozzleless magnetofluidic recording comprising the steps of providing a magnetofluidic material on the surface of a nozzleless support member for emitting a concentrated magnetic flux, said support being disposed opposite to and facing a recording surface, applying a magnetic force by at least the concentrated magnetic flux emitted from said nozzleless support member to said magnetofluidic material to cause a protrusion of said magnetofluidic material from said surface of said support member in a direction toward said recording surface, said protrusion being free from contact with said recording surface, applying an electrostatic or magnetic flinging or migrating force between said support member and an opposing pole provided near said recording surface to fling or migrate magnetofluidic material from a protruded part of said protruded magnetofluidic material to said recording surface, and producing a recording image by causing at least one of said magnetic force or said flinging or migrating force to vary in correspondence with a recording signal.

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**4,315,268**

## RECORDING APPARATUS

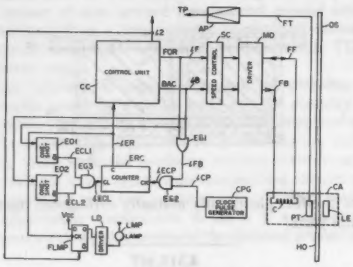
**Shigemitsu Tazaki, Matsudo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed May 20, 1980, Ser. No. 151,701**
**Claims priority, application Japan, Jun. 4, 1979, 54-69618**
**Int. Cl.³ G01D *15/28***
**U.S. Cl. 346—17** **5 Claims**

1. Recording apparatus comprising:
linear motor means;

a carriage having a printing head and displaceable by said linear motor means;

means for detecting an abnormal stop of said carriage; and




means for stopping the driving of said linear motor means in response to said detecting means.

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**4,315,269**

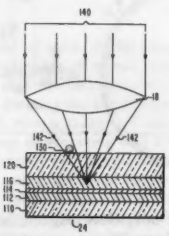
**THICK PROTECTIVE OVERCOAT LAYER FOR OPTICAL VIDEO DISC**

**Allen Bloom, East Windsor, N.J.; Sidney S. Seffren, Philadephia, Pa.; Alan E. Bell, East Windsor, and Robert A. Bartolini, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed Aug. 29, 1977, Ser. No. 828,815**

**Int. Cl.³ G01D *15/34***

**U.S. Cl. 346—135.1** **10 Claims**




1. A record blank for use with a recording laser beam providing light of a given frequency, said blank comprising:

a layer of material which is reflective of light of said frequency,

a layer of material which is an organic dye highly absorptive of light of said frequency overlying said light reflective layer, and

a thick, transparent, inert, protective overcoat comprising a silicone resin between about 0.05 millimeter and 1 millimeter thick overlying said light absorptive layer whereby surface contaminant particles are out of focus of said recording light beam.

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**4,315,270**

**BACKUP ELECTRODE FOR AN ELECTROSTATIC RECORDER**

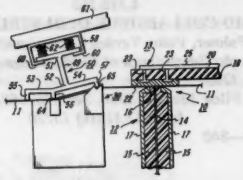
**William A. Lloyd, Saratoga, and David D. Thornburg, Los Altos, both of Calif., assignors to Xerox Corporation, Stamford, Conn.**

**Continuation of Ser. No. 911,584, Jun. 1, 1978, abandoned. This application Dec. 6, 1979, Ser. No. 101,028**

**Int. Cl.³ G03G *15/04***

**U.S. Cl. 346—155** **9 Claims**

1. An electrostatic recorder for forming an electrostatic image on a recording medium interposed between an array of backup electrodes positioned in opposite and opposed relation to an array of recording electrodes, a charging path established between pairs of said electrodes upon appropriate electrical addressing thereof, said backup electrodes characterized by each comprising an electrically resistive thin elastomeric strip



element mounted on a resilient foam like support, said element being electrically isolated from adjacent elements and electrically independent of its support, said element having a resistance value sufficient to prevent damage to the recording electrodes due to an electrical short condition in said charging path.

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**4,315,271**

**POWER TRANSISTOR AND METHOD OF MANUFACTURING SAME**

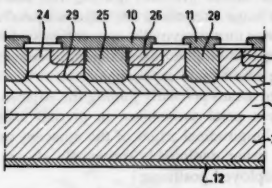
**Bernard Roger, Carpiquet, France, assignor to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 859,602, Dec. 12, 1977, abandoned. This application Mar. 27, 1980, Ser. No. 134,395**

**Claims priority, application France, Dec. 20, 1976, 76 38303**

**Int. Cl.³ H01L *29/06***

**U.S. Cl. 357—20** **4 Claims**

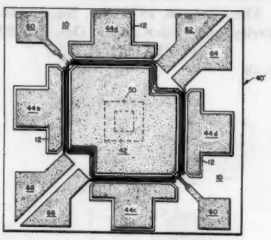



1. A power transistor with three active zones having a semiconductor body comprising a first semiconductor layer of a first conductivity type forming at least a part of the collector zone of the transistor, a second layer of the second conductivity type which adjoins said first layer and which forms the base zone, an emitter zone which comprises a part of a third semiconductor layer of the first conductivity type which adjoins the second layer and a more highly doped surface region of the first conductivity type present therein, the part of the third layer forming the emitter zone being bounded by and contacting a highly doped base contact zone of the second conductivity type which connects the second layer to the surface, said surface region being spaced apart from the base contact zone, and means for causing said transistor to exhibit a defocalization effect in operation at any current level, said means comprising a central base region of the second conductivity type having a higher doping than that of the base zone and located in the central part of the emitter zone, said central base region extending into the second semiconductor layer and the surface layer and being surrounded by parts of both the emitter-base junction and the junction between the surface region and the third layer which extend parallel to the surface.

## 4,315,272
## FIELD EFFECT TRANSISTOR

James L. Vorhaus, Newton, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 41,157, May 21, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 219,039
Int. Cl.[3] H01L *29/76*
U.S. Cl. 357—22 2 Claims



1. A field effect transistor comprising:
(a) a semiconductor;
(b) a central electrode means in contact with such semiconductor for providing a central region in the semiconductor for the device;
(c) a plurality of separate, electrically independent electrode means in contact with such semiconductor for providing a plurality of electrically independent regions in the semiconductor disposed about the periphery of the central region;
(d) a common gate electrode means for controlling a flow of carriers in the semiconductor between the central region and a plurality of the electrically independent regions; and
(e) a plurality of separate, electrically independent gate electrode means, each one of such separate gate electrode means being adapted to control a flow of carriers in the semiconductor between the common region and a corresponding one of the plurality of electrically independent regions.

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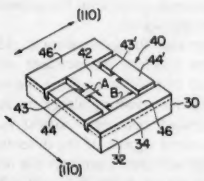
## 4,315,273
## COMPOUND SEMICONDUCTOR HALL EFFECT ELEMENT

Kaneo Yamamoto; Hiroshi Nakamura, and Toshio Konno, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Nov. 7, 1979, Ser. No. 91,937
Claims priority, application Japan, Nov. 24, 1978, 53-145156
Int. Cl.[3] H01L *27/22*
U.S. Cl. 357—27 4 Claims




1. In a Hall effect element having a substrate which is made of a single crystal of a compound semiconductor made to be semi-insulating, and has a major surface given by a (1 0 0) crystal plane of the single crystal and a conducting layer of an impurity-doped compound semiconductor formed on the major surface of the substrate, and selectively etched together with a surface region of the substrate such that the Hall effect element has a Hall-pattern which provides a pair of input end terminals respectively, at both ends of a longitudinally extending region and a pair of output terminals respectively, at both ends of a laterally extending region,
the improvement comprising said Hall-pattern being formed in such an orientation that the direction of current inflow in said Hall-pattern through said input terminals substantially coincides with a predetermined crystallographic direction of said single crystal in said (1 0 0) crystal plane, said predetermined crystallographic direction being one of the [1 $\bar{1}$ 0] direction and the [1 1 0] direction.

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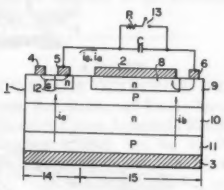
## 4,315,274
## THYRISTOR WITH SWITCHABLE CAPACITOR BETWEEN AUXILIARY THYRISTOR CATHODE AND MAIN THYRISTOR GATE REGIONS

Hiroshi Fukui, and Shin Kimura, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 904,771, May 11, 1978, abandoned. This application Jun. 17, 1980, Ser. No. 160,567
Claims priority, application Japan, May 23, 1977, 52-58833
Int. Cl.[3] H01L *29/74*
U.S. Cl. 357—38 7 Claims




1. An arrangement for increasing the current rise rate capabilities of a pnpn-type switching thyristor, comprising:
an auxiliary thyristor consisting of two outer and two intermediate semiconductor layers of alternate conductivity type, with a pn junction defined between any two adjacent layers, and said auxiliary thyristor having a pair of main surfaces on the opposite sides and also having an anode electrode affixed to one of said outer layers, a cathode electrode affixed to the other one of said outer layers and a gate electrode affixed to one of said intermediate layers;
a main thyristor consisting of two outer and two intermediate semiconductor layers of alternate conductivity types, with a pn junction defined between any two adjacent layers, and said main thyristor having a pair of main surfaces on the opposite sides and also having an anode electrode affixed to one of said main outer layers, a cathode electrode affixed to the other of said main outer layers and a gate electrode affixed to one of said main intermediate layers;
said main and auxiliary cathode electrodes and said main and auxiliary gate electrodes each being separate from and spaced from the others;
means for connecting said anode electrodes of said auxiliary and main thyristors in common;
a capacitor; means connecting said capacitor between said cathode electrode of said auxiliary thyristor and said gate electrode of said main thyristor with said connection being external of said layers;
a control current input directly connected to said auxiliary gate electrode;
two load terminals, respectively, directly connected to said main cathode electrode and said main anode electrode;
said control current input, said auxiliary gate electrode, said auxiliary one intermediate layer, said auxiliary other outer layer, said auxiliary cathode electrode, said capacitor, said main gate electrode, said main one intermediate layer, said main other outer layer, said main cathode electrode, and

one of said load terminals being in named order series circuit so that control current will flow from said control current input through said series circuit to said main cathode electrode during charging of said capacitor and switching of said main thyristor, and so that with full charging of said capacitor there will be blocking of further current flow through said main thyristor gate electrode; and

means for discharging the electric charges stored in said capacitor.

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**4,315,275**

**ACOUSTIC STORAGE DEVICE INTENDED IN PARTICULAR FOR THE CORRELATION OF TWO HIGH-FREQUENCY SIGNALS**

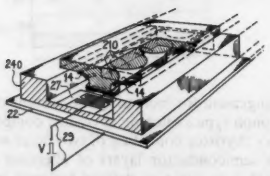
**Alain Bert; Bernard Leclerc, and Yves Archambault, all of Paris, France, assignors to Thomson-CSF, Paris, France**

**Filed Jun. 25, 1979, Ser. No. 51,958**

**Claims priority, application France, Jun. 29, 1978, 78 19504**

**Int. Cl.³ H01L *29/06, 27/02, 29/92***

**U.S. Cl. 357—56** **5 Claims**




1. Acoustic storage device intended in particular for the correlation of two high-frequency signals, comprising a network of cells, each cell constituted by a diode in series with a capacitor, each diode comprising an insulated electrode disposed on the surface of a semiconductor substrate, the dielectric of the capacitors being formed by an insulated piezoelectric material with their electrodes being formed on the one hand by the insulated electrodes of the diodes, and on the other hand by a conductive electrode which is common to all the cells, acoustic surface waves being created on the piezoelectric material and collected by two transducers and the diodes aligned in the direction of propagation of the waves forming a network which is realized on a semiconductor substrate of high resistivity, amounting to several tens to several hundred ohms-centimeter, each diode comprising:

a planar junction on the semiconductor substrate;

an insulating ring covering the periphery of the junction and projecting beyond the substrate, this insulating ring having external dimensions smaller than the second face of the substrate reserved for each diode, the dimensions of the first face of the substrate being reduced by a mesa attack so that the insulating ring projects beyond the first face;

a metallic layer establishing an ohmic contact with the central part of the first face and forming said insulating electrode;

a metallic layer also covering the lateral walls of the diode formed by the mesa attack except for those zones of these walls beyond which the insulating ring projects and constituting another electrode which is common to all the cells; whereby the metallic layer covering the lateral walls enables the radio-frequency losses to be limited; the increase the depth of valleys between mesas reduces paracitic capacitance; and said high resistivity substrate with the mesa and electrode structure improves the memorization time of the acoustic storage device.

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**4,315,276**

**VIDEO SIGNAL DEFECT COMPENSATION SYSTEM**

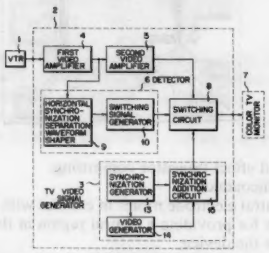
**Tsuyoshi Harada, 3223-1 Bushozanchokouchome, Takamatsu-shi, Kagawa-ken, and Yoshie Oritake, 7-18-401, Hanamigawa, Chiba-shi, Chiba-ken, both of Japan**

**Filed Jun. 26, 1979, Ser. No. 52,164**

**Claims priority, application Japan, Oct. 21, 1978, 53-129751**

**Int. Cl.³ H04N *5/76***

**U.S. Cl. 358—8** **8 Claims**




1. A video signal defect compensation system for use with a video signal reproducing device, the device having a reproduction video signal output corresponding to a prerecorded program displayed on a video monitor, comprising:

means for detecting the presence or absence of the reproduction video signal, said detecting means comprising:

a synchronization separating circuit for separating the synchronizing signal from the reproduction video signal of the video signal reproducing device; and,

a switching signal generator for receiving the synchronizing signal separated by the synchronization separating circuit and for producing a first switching control signal representing the absence of the reproduction video signal, when a plurality of drop outs occurs in the synchronization separating circuit signal output and for producing a second switching control signal representing the lapse of a predetermined time from when the synchronization separating circuit detects the synchronizing signal after absence of the reproduction video signal has been previously determined;

a video signal generator for generating a composite video signal to be displayed on the monitor when the reproduction video signal drops out, said video signal generator comprising:

a synchronization generator for generating a composite synchronizing signal;

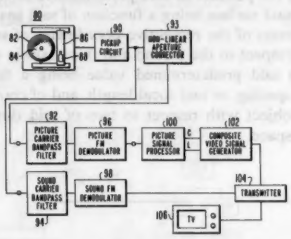
a video generator for generating a video signal, having information content independent of the prerecorded program, to display an image on the video monitor; and,

switching means for selecting either the reproduction signal or the generated composite signal in response to the switching control signals of the detecting means, and for supplying the selected signal to the video monitor, the reproduction signal being selected when the detecting means detects the reproduction signal and the generated composite signal being selected when the detecting means detects the absence of the reproduction video signal, whereby a picture image will be displayed on the monitor whenever the reproduction video signal drops out, but absence of the synchronizing signal immediately after video playback commences will not result in unnecessary interruption of the program.

## 4,315,277
## NON-LINEAR APERTURE CORRECTION CIRCUIT HAVING A SIGNAL BYPASS ARRANGEMENT

Walter G. Gibson, and Theodor M. Wagner, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 19, 1980, Ser. No. 122,723
Int. Cl.³ H04N 5/78, 5/76
U.S. Cl. 358—8 7 Claims




7. In a disc record player for information recovery of video and sound signals, said player including means for recovering modulated information signals including composite color video signals occupying a given band of frequencies with sound accompaniment from a disc record, said composite color video signals containing a plurality of undesired interference components in said given band of frequencies; means for demodulating said information signals, means, coupled to said demodulating means, for processing said demodulated signals, and a non-linear compensator, for effecting a substantial removal of said undesired interference components, said non-linear compensator comprising:

a terminal;

a linear signal path, coupled to said terminal, for transferring signals having said undesired interference components to a summing node, said first signal path having a negligible phase shift over said given band of frequencies;

a first non-linear signal path, coupled to said terminal, for transferring signals to said summing node and for generating a correction signal complementary to a first undesired interference component; and

a second non-linear signal path, coupled to said terminal, for transferring signals to said summing node and for generating another correction signal complementary to a second undesired interference component;

the resulting signal formed by the combination of the signals from the linear signal path and the first and second non-linear signal paths at said summing node being substantially free of said first and second undesired interference components.

## 4,315,278
## APPARATUS FOR PROVIDING ERROR COMPENSATION IN A DIGITAL VIDEO RECORDING AND REPRODUCING SYSTEM

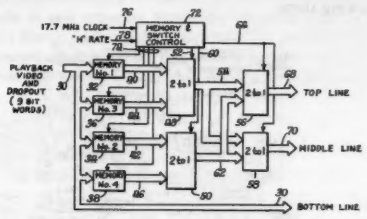
Leonard A. Pasdera, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed May 23, 1980, Ser. No. 153,111
Int. Cl.³ H04N 9/39, 9/491
U.S. Cl. 358—16 13 Claims

1. Apparatus for providing substitute digital data words in a stream of digital data word samples representing a video information signal of a PAL television format that has been digitally sampled alternately along the U and V axes to produce U and V data word samples at a rate of four times the chrominance subcarrier frequency, comprising:

means for receiving and storing said video data word samples from at least three successive horizontal video lines;

means operatively coupled to said storing means for generating a substitute data word sample for any defective one of said U and V samples, a U sample being generated by averaging the value of the immediately preceding U sample from the adjacent preceding horizontal line and the immediately succeeding U sample from the adjacent succeeding video line, a V sample being generated by averaging the value of the immediately succeeding V sample



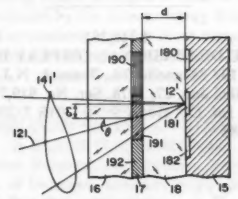

from the adjacent preceding video line and the immediately preceding V sample from the adjacent succeeding video line;

switching means for providing one of said generated samples at the output in response to an activating signal being received.

## 4,315,279
## COLOR IMAGE DETECTING DEVICE

Tetsuro Kuwayama, Yokohama, and Kazuo Tanaka, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1980, Ser. No. 184,753
Claims priority, application Japan, Sep. 13, 1979, 54-117784
Int. Cl.³ H04N 9/07
U.S. Cl. 358—44 5 Claims




1. A color image detecting device comprising:

a photodetector having a plurality of image element areas arranged one-dimensionally or two-dimensionally;

an imaging optical system for forming an object image on the light-receiving surface of said photodetector; and

a color filter having a plurality of filter elements each having a spectrum transmittivity for obtaining a color signal, said filter elements being arranged correspondingly to said image element areas and set at a pitch shorter than the division interval of said image element areas.

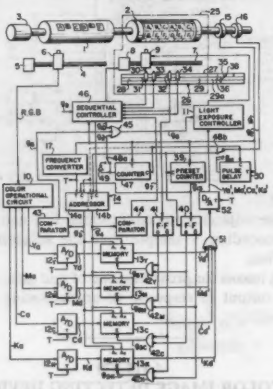
## 4,315,280
## METHOD FOR REPRODUCING COLOR SEPARATION PICTURES ON A RECORDING MATERIAL FROM ORIGINAL PICTURES

Masanori Tsuda, Kyoto, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaishi, Kyoto, Japan

Filed Mar. 24, 1980, Ser. No. 133,588
Claims priority, application Japan, Apr. 13, 1979, 54-44216
Int. Cl.³ G03F 3/00
U.S. Cl. 358—80 3 Claims

1. A method for reproducing color separation pictures on a recording material from original pictures, wherein an original picture is color-separated and color-corrected to obtain color

separation picture signals of primary colors, and then said color separation picture signals obtained are stored in a memory, and when color separation pictures of the original picture are reproduced in recording areas to which each of color inks is allocated corresponding to the primary colors or a reproducing material according to the other separation picture signals read out of said memory, characterized by comprising the following steps:



dividing said recording areas into a number of recording sub-areas corresponding to the number of original pictures;

allocating the original pictures to said sub-areas; and

recording each of said color separation printing plates obtained by scanning each of said original pictures on said respective allocated sub-areas.

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**4,315,281**

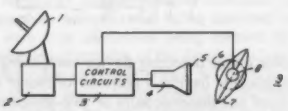
## THREE-DIMENSIONAL DISPLAY DEVICE

**Jack Fajans, 1133 Magnolia Rd., Teaneck, N.J. 07666**

**Filed Jun. 27, 1978, Ser. No. 919,725**

**Int. Cl.³ H04N 9/54; G01S 7/20**

**U.S. Cl. 358—88** **5 Claims**




1. A device for displaying the location of an object relative to three axis intersecting each other perpendicularly in a space, the device comprising:

(a) a source of a location signal indicative of the instantaneous coordinates of said object with respect to each of said three axes in said space;

(b) means defining a surface and two axes of a system of coordinates in said surface perpendicularly intersecting each other;

(c) optical means for projecting an image of a point in said surface, said optical means having an optical axis and a focal length;

(d) rotating means for rotating said optical means about an axis of rotation transverse to said optical axis and extending in a common direction with said surface, said axis of rotation being spaced from said surface;

(e) first signal generating means for generating an angle signal indicative of the instantaneous angle defined by said optical axis and a line perpendicular to said surface; and

(f) second signal generating means operatively connected to said source and to said first signal generating means for producing a visible, luminous signal in said point of said surface when said instantaneous angle assumes a predetermined value,

(1) the position of said point relative to one of said axes in said surface being a function of the spacing of said axis of rotation from said surface and of the ratio of the respective coordinates of said object with respect to a first and a second one of said three axes in said space,

(2) the position of said point relative to the other axis in said surface being a function of said spacing and of the ratio of the respective coordinates of said object with respect to the second and third axes in said space,

(3) said predetermined value being a function of said spacing, of said focal length, and of coordinates of said object with respect to two of said three axes in said space.

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**4,315,282**

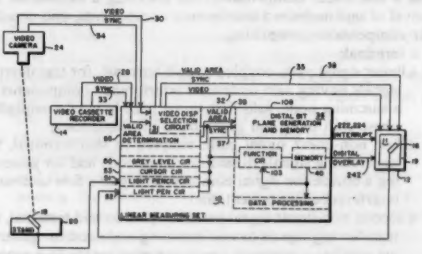
## WRITE AND EDIT CIRCUITRY FOR ELECTRONIC MARKING OF DISPLAYED TV SIGNAL IMAGES

**Peter M. Schumacher, Great Falls, Mont., assignor to Electronic Devices Incorporated, Mont.**

**Filed Sep. 11, 1980, Ser. No. 186,392**

**Int. Cl.³ H04N 7/18**

**U.S. Cl. 358—107** **34 Claims**




1. Write and edit circuitry for electronic marking of electronically displayed video images comprising

video image generating means for generating at least one video image signal to be displayed;

electronic marking means for providing a logic level signal to be displayed;

video overlay means connected to the electronic marking means for generating a digital bit plane overlay signal to be displayed which is synchronized with the video image signal comprising;

memory means for selectively storing the logic level signals as data bits for the digital bit plane overlay signal; and

display means connected to the video image generating means, the electronic marking means and the video overlay means comprising;

means for displaying the video image;

means for displaying the logic level signals as they they are generated; and

means for displaying the data bits stored in the memory means;

wherein the logic level signals generated by the marking means are displayed during the same scan that the logic level signals are generated and are displayed in subsequent scans if stored as data bits in the memory means.

## 4,315,283

## HIGH DENSITY RECORDING SYSTEM USING SIDE-BY-SIDE INFORMATION AND SERVO TRACKS

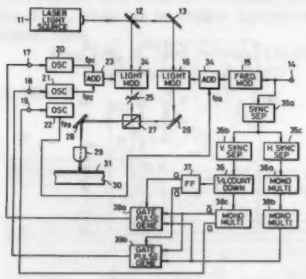
Hisao Kinjo, and Keiji Ozawa, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation-in-part of Ser. No. 785,095, Apr. 6, 1977. This application Apr. 25, 1979, Ser. No. 33,324

Claims priority, application Japan, Apr. 8, 1976, 51-38809; Oct. 26, 1976, 51-127767

Int. Cl.³ H04N 5/76; G11B 11/12

U.S. Cl. 358—128.6 2 Claims




1. An information signal recording system comprising:

means for rotating a recording disc;

means for producing two light beams;

means for producing and sequentially switching first and second reference signals which have different frequencies, such that said reference signals correspond to each rotating period of the recording disc, and means for further producing a third reference signal which has a frequency that is different from the frequencies of the first and second reference signals, said third signal being produced responsive to said switching of the first and second reference signals;

means for adding said third reference signal and an information signal which are to be recorded;

a first light modulating means for modulating one of said two light beams with the output signal of said adding means;

a second light modulating means for modulating the other of said two light beams responsive to the first and second reference signals; and

recording means for simultaneously forming an information signal track on the recording disc responsive to the light beam modulated by the first light modulating means and a reference signal track on an intermediate part of said recording disc between center lines of adjacent information signal tracks, said recorded signals being responsive to the light beam modulated by the second light modulating means,

said first and second reference signals being alternately recorded on the reference signal track each rotating period of the recording disc, said third reference signal being recorded at a predetermined position on the information signal track each rotating period of the recording disc.

## 4,315,284

## THERMAL SCANNING DEVICES

Peter F. T. C. Stillwell, Aldershot; William T. Moore, London, and David G. A. Demaine, Leeds, all of England, assignors to The Rank Organisation Limited, London, England

Filed Jul. 18, 1980, Ser. No. 170,177

Claims priority, application United Kingdom, Jul. 20, 1979, 25362/79

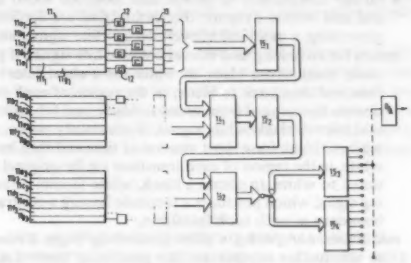
Int. Cl.³ H04N 5/30

U.S. Cl. 358—209 6 Claims

1. An optical scanning device for producing electrical picture-information signals representative of a scene under surveillance, said device comprising:

a detector array having a predetermined number of rows each of at least one detector element and such arranged to product electrical output signals indicative of light incident thereon,

optical means arranged to cause a repeated monitoring of the whole of said scene by repeatedly effecting a number of scans during each of which incident light received from a corresponding band of the surveyed scene is scanned across said detector array, the output signals produced by



each said rows of the detector array during a said scan representing a respective line of picture information taken from the corresponding band of the surveyed scene, said optical means being so arranged that during each monitoring of the scene successively scanned bands overlap each other in a direction transverse to the direction of scanning by an amount sufficient to cause each said line of picture information to be represented more than once, and

signal processing means arranged to receive the said output signals produced by the detector array during each monitoring and to combine together those signals which represent the same line of picture information.

## 4,315,285

## METHODS FOR CONVERTING A VIDEO SIGNAL INTO A BLACK/WHITE SIGNAL

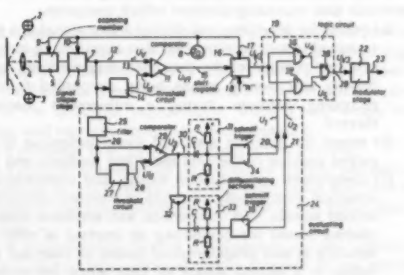
Ruediger Sommer, Raisdorf, and Hermann Wischer, Kiel, both of Fed. Rep. of Germany, assignors to Dr.-Ing. Rudolf Hell GmbH, Kiel, Fed. Rep. of Germany

Filed Aug. 1, 1979, Ser. No. 62,696

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1978, 2836571

Int. Cl.³ H04N 1/00

U.S. Cl. 358—280 12 Claims



1. An arrangement for converting a video signal into a bi-level black/white recording signal in facsimile reproduction, comprising

a scanning member for obtaining a video signal by scanning

an original having white, black, and tinted (grey or colored) areas,

a threshold circuit following said scanning member and arranged to form a first dynamic threshold signal,

a comparator to which said video signal and said dynamic threshold signal are applied, for generating a bilevel black/white signal,

a device connected to said scanning member for generating a modified videosignal by suppressing the DC component of said video signal,

a further threshold circuit following said device, arranged to form a second dynamic threshold signal,

a further comparator to which said modified video signal and said second dynamic threshold signal are applied, for generating a modified bilevel black/white signal, and

means for switching said bilevel black/white signal, if previously black, from black to white for a short interval of time and then back to black, in the region of each transition on the original from tinted to black, and for switching said bilevel black/white signal, if previously white, from white to black for a short interval of time and then back to white, in the region of each transition on the original from tinted to white, to obtain a black/white facsimile recording signal which produces a facsimile having a contrasting boundary at each such transition,

said means comprising a pulse generating stage, connected to said further comparator, for generating control signals from the modified video signal, and a logic switching circuit connected to said comparator and said pulse generating stage.

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**4,315,286**

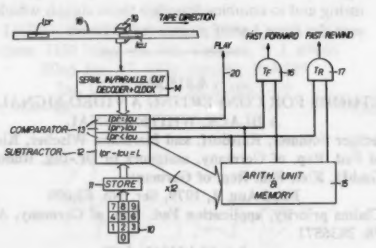
## RECORDERS

**Peter Copeland, 11, June Close, Pagham, Bognor Regis, Sussex P021 4UH, England**

**Filed Sep. 6, 1979, Ser. No. 72,904**

**Int. Cl.³ G11B** *15/18, 27/24*

**U.S. Cl. 360—72.2** **5 Claims**




1. An attachment for a data recording machine having a movable data recording medium which comprises:

(a) means for receiving and storing a first signal at a predetermined instant of time, said first signal being indicative of a rest position of the data recording medium, said receiving and storing means being decoupled from said recording medium during a subsequent movement thereof;

(b) means for entering a second signal indicative of a required position of the data recording medium; and

(c) comparison and actuation means, said comparison and actuation means being arranged to compare said first and second signals, said comparison and actuation means including means for computing an interval of time commencing at said predetermined instant of time and terminating at a second instant of time when the recording medium would reach said required position upon a moving of said recording medium, thereby predicting any required operation of fast-rewind or fast-forward controls of the data recording machine, an actuator of said comparison and actuation means imparting motion to said recording medium during said time interval and terminating said motion at said second instant of time.

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**4,315,287**

## MAGNETIC TAPE TRANSPORT SYSTEM

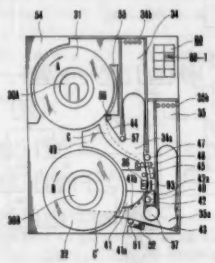
**Kunio Noguchi, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Japan**

**Filed Jun. 6, 1979, Ser. No. 46,189**

**Claims priority, application Japan, Jun. 19, 1978, 53/74415**

**Int. Cl.³ G11B** *15/58, 15/66*

**U.S. Cl. 360—95** **8 Claims**



1. A magnetic tape transport system of the vacuum column tape comprising: a housing having a base member; a pair of reel mounting means disposed one over the other and closely adjacent to each other for removably mounting an upper tape supply reel and a lower tape take up reel; guide means for guiding a tape from said upper supply reel to said lower take up reel along a predetermined essentially straight line tape path that extends downwardly towards the base member and take up reel; a supply vacuum column disposed adjacent to said supply reel and having an open end for receiving tape delivered from said supply reel while said transport system is running located along the predetermined tape path; a take up vacuum column juxtaposed to and extending substantially parallel with said supply vacuum column, said take up vacuum column having an open end for receiving said tape while said tape transport system is running positioned at a location further along the path of movement of said tape from the open end of said supply vacuum column; said supply and take up vacuum columns having the open ends thereof extending downwardly toward the base member in the same direction and disposed substantially along the predetermined tape path of movement at spaced-apart locations; a magnetic head assembly positioned along the tape path of movement between the spaced-apart locations of the open ends of the supply and take up vacuum columns and disposed substantially on a line that extends in common with a wall of said supply vacuum column and a juxtaposed wall of the adjacent take up column, said magnetic head assembly opposing said tape and serving as part of the guide means for tape delivered from said supply vacuum column; an upper tape threading guide member located on the tape path between said supply reel and said magnetic head for guiding the tape during threading past the magnetic head assembly; lower automatic tape threading means located on the tape path between said magnetic head and said take up reel of providing automatic take up of said magnetic tape on said take up reel during threading, said lower automatic tape threading means comprising tangential air ejecting means for ejecting air in a direction tangential to the direction of said magnetic tape path during threading for moving the tape in the direction of the take up spool, and transverse air ejecting means disposed on the opposite side of said magnetic tape with respect to said tangential air ejecting means for ejecting air transversely against said magnetic tape to cause it to bend toward said take up reel during threading so as to be automatically wound therearound; and a capstan disposed substantially on said line

and immediately adjacent the open end of said take up vacuum column, for driving said tape after threading, said capstan being located at a position on the tape path of movement below said magnetic head assembly and where the tape is reversed back into the open end of said take up vacuum column during operation prior to passing to the take up reel.

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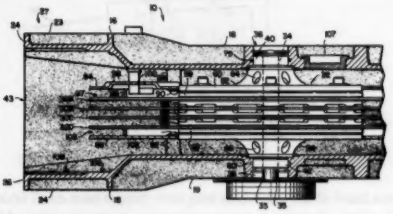
**4,315,288**

## DISK HOUSING FOR DISK MASS STORAGE UNIT INCLUDING INTEGRAL MEANS FOR REDUCING TEMPERATURE DIFFERENTIALS AMONG DISKS

**Frank W. Bernett, and Peter R. Svendsen, both of Colorado Spring, Colo., assignors to Digital Equipment Corporation, Maynard, Mass.**

**Filed Feb. 29, 1980, Ser. No. 126,021**
**Int. Cl.³ G11B *17/02, 23/02***
**U.S. Cl. 360—98** **7 Claims**



1. A housing assembly for a plurality of rotatable, spaced-apart, coaxial disks for use in a mass information storage subsystem of a data processing system, at least one of the disks constituting an outer disk and at least one of the disks constituting an inner disk, said housing assembly comprising a housing defining a chamber for receiving said disks, said housing including means integral therewith inside the chamber for reducing the temperature differential between the outer disk and the inner disk including a flange means supported by said housing and extending at least a portion of the way around the periphery of the outer disk to limit the air flow over the outer surface of said outer disk.

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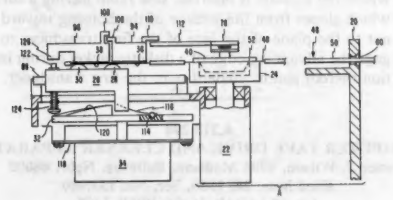
**4,315,289**

## MAGNETIC DISK DRIVE MACHINE

**Joseph J. Holecek, Kasson, and Michael N. Zell, Rochester, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Oct. 9, 1979, Ser. No. 82,447**
**Int. Cl.³ G11B *5/016, 21/08, 17/02, 5/55***
**U.S. Cl. 360—99** **4 Claims**



1. A drive machine for a magnetic disk including:
a machine frame,
means carried by said frame for gripping the disk at its center and rotatably driving the disk and including a rotatable disk drive spindle carried by said frame,
a carriage carrying a pair of transducers adapted to be in data transfer position with respect to one face of the disk,
means movably mounting said carriage with respect to said frame so that the transducers move across the disk toward and away from an outer edge thereof with each of the two transducers traversing about one-half of the radial dimension of the usable data recording space on the disk,
a pair of pads,
a pair of swing arms swingably mounted on said frame for holding said pads respectively in engagement with the other face of the disk each aligned opposite one of said two transducers,
a face cam having a spiral edge traversing a distance equal to substantially one-half of said radial dimension,
a follower connecting said spiral edge and said carriage whereby each of said heads move across substantially one-half of said radial dimension, and
a cam portion on said face cam and interconnections between said cam portion and said two swing arms so that, when said face cam is rotatably moved to bring said two transducers to limits of their movements, said cam portion and said interconnections coact with said swing arms to swing the arms and move said pads out of engagement with the disk.

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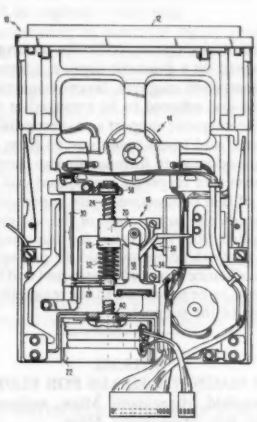
**4,315,290**

## APPARATUS FOR SHIFTING THE MAGNETIC READ/WRITE HEAD CARRIAGE IN A FLOPPY DISK DRIVE UNIT

**Jagmohan S. Kukreja, Claremont, Calif., assignor to Siemens Corporation, Iselin, N.J.**

**Filed Jan. 11, 1980, Ser. No. 111,226**
**Int. Cl.³ G11B *21/08, 5/55***
**U.S. Cl. 360—106** **6 Claims**



1. A magnetic recording device having a carriage supporting at least one magnetic head and means for shifting said carriage in a radial direction relative to a center driven, pliant magnetic disk to effect data transfer with selectable tracks on at least one side of the disk, the improvement wherein said means for shifting said carriage comprises, in combination:
(a) a rotatable shaft having a helical screw portion;
(b) a carriage nut arranged on said screw portion and moveable in the axial direction of said shaft when said shaft is rotated, thereby to move said carriage in said radial direction;
(c) a stepper motor having a permanent magnet rotor arranged coaxially with and rigidly attached to one end of said shaft for selectively rotating said shaft;
(d) a first bearing disposed adjacent said rotor for rotatably holding both said rotor and said shaft in the region of said motor; and
(e) a second bearing disposed adjacent the end of said shaft

opposite said motor for rotatably holding said shaft at said opposite end;

whereby said shaft and said rotor are held in position only by said first and second bearings.

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**4,315,291**

**MAGNETIC TRANSDUCTION DEVICE WITH MAGNETORESISTANCES**

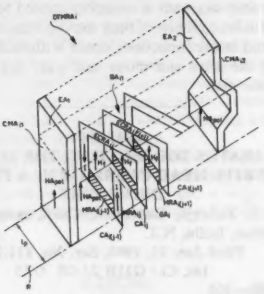
**Jean-Pierre Lazzari, Montfort l'Amaury, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France**

**Filed Dec. 18, 1979, Ser. No. 104,852**

**Claims priority, application France, Apr. 25, 1979, 79 10562**

**Int. Cl.³ G11B** *5/22, 5/20, 5/30*

**U.S. Cl. 360—113** **4 Claims**



1. A magnetic transduction device for reading and/or writing data contained on a magnetic support comprising:

two thin superposed magnetic layers magnetically coupled at one end and adapted to be arranged at the other end close to the magnetic support and substantially perpendicular thereto, said layers being spaced from each other at said other end so as to form an air gap therebetween;

a coil between thin magnetic layers, said coil comprising a plurality of thin conductive layers superposed in a direction perpendicular to the plane of the said magnetic layers and separated from each other by thin conductive layers having a part extending into said air gap and at least one magnetoresistance disposed in said part and situated in the air gap so as to be submitted to the magnetic leakage field of the data of the support.

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**4,315,292**

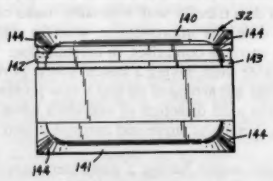
**BEVELED MAGNETIC HEADS FOR FLOPPY DISK**

**Leonard E. Kronfeld, Minneapolis, Minn., assignor to Nortronics Company, Inc., Minneapolis, Minn.**

**Filed Oct. 5, 1979, Ser. No. 82,235**

**Int. Cl.³ G11B** *5/22, 5/48, 5/54, 21/16*

**U.S. Cl. 360—122** **5 Claims**




1. A magnetic transducer for use in a magnetic disk data storage system, comprising core and ceramic pieces bonded together to form a transducer body having a planar face with the gap positioned therein for contact with a disk recording medium in data transfer operations, the edges of the transducer body adjacent said face being beveled, the corners at the intersections of the adjacent edges being beveled, and the edge and corner bevels blended or radiused into the planar face to avoid surface discontinuities, whereby stress concentrations on the recording medium are avoided in case of engagement of the corners or edges of the transducer with the recording medium during transducer loading and unloading.

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**4,315,293**

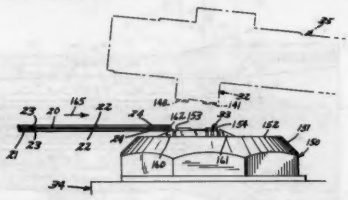
**TRANSDUCER PROTECTION GUIDE FOR DISKETTE INSERTION AND REMOVAL**

**Thomas J. Winkler, Isanti, Minn., assignor to Nortronics Company, Inc., Minneapolis, Minn.**

**Filed Oct. 5, 1979, Ser. No. 82,234**

**Int. Cl.³ G11B** *5/22, 5/48, 5/54, 21/16*

**U.S. Cl. 360—130.2** **4 Claims**




1. A magnetic transducer supporting assembly for a double sided floppy diskette recording system, comprising:

a transducer support carriage;

a transducer support housing mounted on said carriage;

a first magnetic transducer having a planar face for operatively contacting the diskette recording medium;

means for mounting the first transducer to said housing with at least a portion thereof including the planar face projecting from the surface of the housing to permit contact with the disk recording medium during data transfer operations;

a support arm having a second magnetic transducer mounted adjacent one end thereof and hinged at its other end to said carriage with the first and second transducers in generally opposed relationship, so that the support arm can be opened to permit insertion of a diskette generally between the carriage and the support arm, and so that the support arm can be closed to bring the first and second transducers into operative contact with opposite sides of the diskette recording medium; and

a guide ramp attached to said housing and positioned adjacent the projecting portion of said first transducer along the side portion thereof which faces in the direction from which the diskette is inserted, said ramp having a surface which slopes from the surface of the housing toward but not to the plane of the face of the first transducer to engage the advancing edge of a diskette jacket during insertion thereof and to guide it over the first transducer.

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**4,315,294**

**COMPUTER TAPE DRIVE AND CLEANER APPARATUS**

**Terrance J. Wilson, 1804 Madison, Bellevue, Nebr. 68005**

**Filed Mar. 26, 1980, Ser. No. 133,980**

**Int. Cl.³ G11B** *25/06;* **B08B** *1/02*

**U.S. Cl. 360—137** **14 Claims**

1. A combination tape drive and tape cleaner unit for a computer system wherein information is stored on a magnetic tape carried on a tape supply reel and tape take-up reel, said unit comprising

a housing,

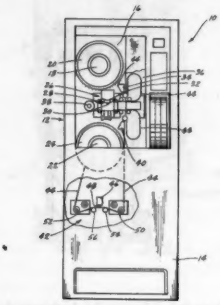
means for rotatably supporting a tape supply reel on said housing,

means for rotatably supporting a tape take-up reel on said housing,

a read-write head assembly mounted on said housing and adapted to read and write information on a magnetic tape carried on the supply and take-up reels,

guide means for operatively directing the tape past said read-write head assembly whereby information may be written thereon or read therefrom,

a capstan assembly for driving the tape in a forward direc-



tion from said supply reel past said read-write head assembly and to said take-up reel and in a reverse direction from said take-up reel, past said read-write head assembly and onto said supply reel, and

a tape cleaner apparatus supported on said housing and adapted to contact tape being driven between said supply reel and take-up reel, said tape cleaner apparatus including a blade holder assembly and a blade supported therein and arranged in engagement with said tape for cleaning the same.

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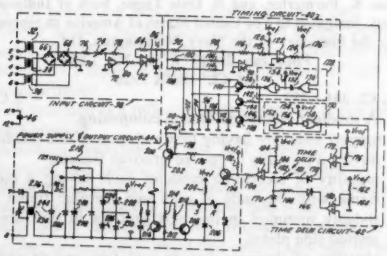
**4,315,295**

**TIMING CIRCUIT FOR AN OVERCURRENT RELAY**

**Stanley E. Zocholl, Holland, Pa., assignor to Gould Inc., Rolling Meadows, Ill.**

**Filed Dec. 17, 1979, Ser. No. 104,199**
**Int. Cl.³ H02H *3/093***
**U.S. Cl. 361—96** **15 Claims**



**1.** An overcurrent relay timing circuit, comprising:

a plurality of non-interacting R-C circuits, each producing a respective signal; and

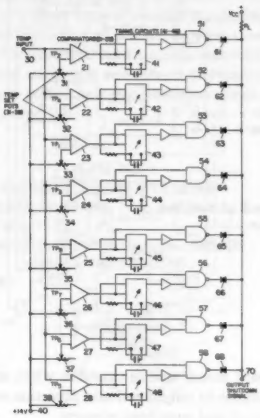
summing means comprising an inverting amplifier for generating a first signal representative of the sum of said respective signal of said R-C circuits.

**4,315,296**

**RELIABLE OVER-TEMPERATURE CONTROL CIRCUIT**

**Geoffrey Hancock, Simi Valley, Calif., assignor to Semco Instruments, Inc., North Hollywood, Calif.**

**Filed Oct. 14, 1980, Ser. No. 197,008**
**Int. Cl.³ H02H *5/04***
**U.S. Cl. 361—103** **6 Claims**



**1.** A digitized over-temperature monitoring and shut-off circuit for turbine engines, comprising:

means for generating an electrical signal corresponding to the temperature of a turbine engine;

a plurality of comparator triggering circuits, each coupled to receive said electrical signal representing temperature, for producing an output signal when the temperature exceeds a preset level;

timing circuit means associated with each comparator triggering circuit for producing an output signal following a predetermined delay interval;

gate output circuit means for receiving input signals, respectively, from each of said comparator triggering circuits and from each said associated timing circuits and for producing an output signal when both signals are present; and

an output control circuit for shutting off the turbine engine when a signal is received from any of said gate output circuits.

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**4,315,297**

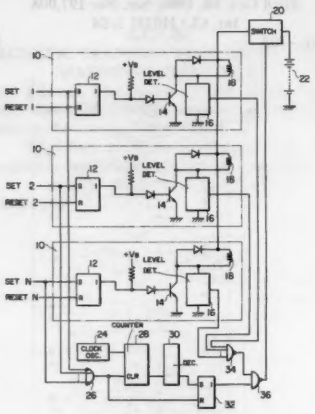
**HAMMER DRIVE SAFETY DEVICE FOR PRINTER**

**Tsuneki Kobayashi, and Hiroshige Nakano, both c/o Hitachi Koki Company Limited, No. 1060, Tadeda, Katsuta-shi, Ibaraki, Japan**

**Continuation-in-part of Ser. No. 862,815, Dec. 21, 1977, abandoned. This application Jul. 11, 1979, Ser. No. 56,736**
**Claims priority, application Japan, Dec. 23, 1976, 51-157028**
**Int. Cl.³ H02H *3/24***
**U.S. Cl. 361—191** **7 Claims**

**1.** A hammer drive safety device for use in a printer which has a plurality of hammer drive circuits, each including a solenoid for driving its associated hammer provided along a character printing line and a switching element coupled to said solenoid, wherein said printer produces a character print command signal and said switching element is rendered conductive responsive to a character print command signal and driving power is supplied from a power source to said solenoid for driving its associated hammer when said switching element is rendered conductive, the improvement comprising: time limiting means adapted to produce an output when said character print command signal is not produced for more than a prede-

termined duration, detection means for detecting the conduction and nonconduction of said switching element and disconnection means interposed in a current path between said solenoid and said power source operable when said time limiting means produces its output and said detection means detects the conduction of said switching element.

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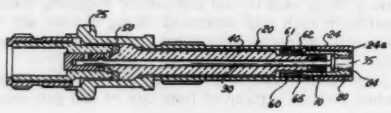
**4,315,298**

## IGNITER PLUG

**George F. Mulkins, Bainbridge; Jerome P. Dombrowski, and Gaston R. Isliker, both of Sidney, all of N.Y., assignors to The Bendix Corporation, Southfield, Mich.**

**Filed Apr. 28, 1980, Ser. No. 144,121**
**Int. Cl.³ F23Q *3/00***
**U.S. Cl. 361—253** **1 Claim**




1. In combination with an ignitor plug of the type having an inner elongated electrode having a front portion and a rear portion; an intermediate elongated insulator disposed around at least a portion of the electrode, said insulator having a front portion, a rear portion, and an axial passage extending through said insulator and having a portion of said electrode mounted therein; an outer elongated electrode comprising a metal shell mounted on the intermediate elongated insulator and disposed around the electrode and electrically isolated therefrom by the insulator, said metal shell having a rear portion and a front end portion which is arranged to provide a spark gap with the end of the front portion of said electrode; means for mounting a portion of the inner electrode within the elongated insulator; means for providing a pressure tight seal between said inner electrode, said elongated insulator and said metal shell; a forward insulator electrically isolating said forward portion of said outer shell from the forward portion of said electrode and being separated by an air space from said inner electrode; means for mounting said forward insulator to said outer shell, the improvement wherein said last mounting means comprises:

a metal ring welded to said outer shell and brazed to the forward insulator.

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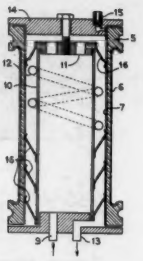
**4,315,299**

## POWER CAPACITOR WITH HIGH HEAT DISSIPATION

**Roland Saint Marcoux, and Leon Fink, both of Paris, France, assignors to L.C.C.-C.I.C.E. Compagnie Europeenne de Composants Electroniques, Bagnolet and Thomson-CSF, Paris, both of, France**

**Filed Jan. 21, 1980, Ser. No. 113,503**
**Claims priority, application France, Jan. 19, 1979, 79 01339**
**Int. Cl.³ H01G *1/08***
**U.S. Cl. 361—274** **11 Claims**




1. A power condenser with high thermal dissipation, comprising:

a hollow dielectric body;

an external armature supported by the outer surface of said body;

an internal armature supported by the inner surface of said body;

a sleeve coaxial with said hollow dielectric body and having a diameter close to the diameter of said body, whereby a space is formed therebetween;

connecting means communicating the side of said sleeve opposite said space with said space; and

at least one static device arranged along a helicoidal pattern in said space, whereby a cooling liquid can flow longitudinally past said opposite side of said sleeve to said connecting means and into said space, whereby said cooling liquid can flow through said space in a helicoidal flow pattern to thereby become stirred and increase the heat transfer between said cooling liquid and said condenser.

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**4,315,300**

## COOLING ARRANGEMENT FOR PLUG-IN MODULE ASSEMBLY

**James K. Parmerlee, and B. Dale Tague, both of Indianapolis, Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jan. 29, 1979, Ser. No. 7,524**
**Int. Cl.³ H05K *7/20***
**U.S. Cl. 361—382** **5 Claims**

1. A modular electronic system comprising,

a support assembly having first and second side plates each having a plurality of spaced grooves therein,

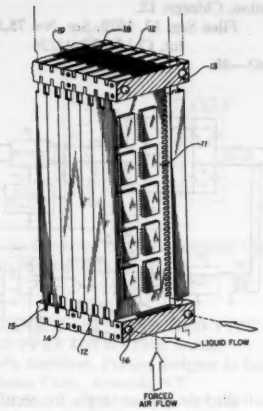
a plurality of electronic modules each having a metallic frame with the ends of each said metallic frame being slidably mounted in opposed grooves in said first and second side plates,

a plurality of through slots in said first and second side plates, each said slot being positioned between adjacent grooves to provide air passages through said first and second side plates,

means for circulating air through said plurality of slots thereby transferring heat from said electronic modules to said first and second side plates,

a first longitudinal cooling passage in each said side plate

positioned above said through slots and behind said spaced grooves and a second longitudinal cooling passage




in each said side plate positioned below said through slots and behind said spaced grooves, and

means for circulating cooling liquid through said passages.

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**4,315,301**

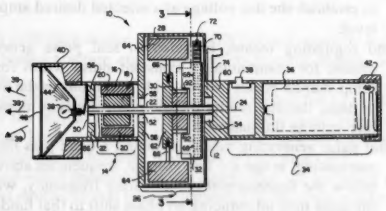
**GENERATOR FLASHLIGHT**

**Carlos L. Jimena, 327 Douglas St., Salt Lake City, Utah 84102**

**Continuation-in-part of Ser. No. 951,783, Oct. 16, 1978, abandoned. This application Jun. 2, 1980, Ser. No. 155,217**

**Int. Cl.³ B62J *5/08***

**U.S. Cl. 362—193** **15 Claims**



1. A self-generating hand-held flashlight comprising:

a tubular housing having first and second coaxial compartments, said second compartment having a diameter that is at least 1.5 times as large as the diameter of said first compartment;

a bulb mounted in a reflector plate positioned at one end of said housing;

a generator positioned in said first compartment of said housing, said generator having a rotor adapted to rotate about a central axis of said tubular housing and said generator being electrically coupled to said bulb;

a high inertia balanced flywheel rotatably mounted in said second compartment about said central axis, said flywheel being directly coupled through a central rotatable shaft to said rotor of said generator, said flywheel having a diameter at least 1.4 times as large as the diameter of said first housing;

manual means for coupling a burst of rotational energy to said flywheel, said means including a slip-clutch adapted to couple said flywheel to externally applied manual energy during an excitation period, and for de-coupling said flywheel from externally applied manual energy during a non-excitation period; and

a plurality of bearings selectively positioned along said shaft for holding said shaft in its desired central position and for minimizing frictional and other losses associated with the rotation of said flywheel, shaft, and rotor of said generator, thereby allowing said flywheel, shaft, and generator rotor to rotate for a relatively long period of time after the application of a short burst of manual rotational energy to said flywheel through said manual means;

whereby said flashlight provides a continuous source of light over both said excitation and non-excitation periods, said non-excitation period being at lease four times as long as said excitation period.

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**4,315,302**

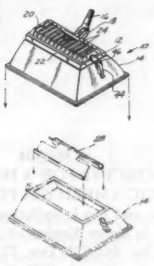
**QUARTZ LIGHT FIXTURE**

**Salvatore C. Petralia, Sayreville, N.J., assignor to Keene Corporation, New York, N.Y.**

**Filed Mar. 13, 1978, Ser. No. 885,634**

**Int. Cl.³ H01R *33/00***

**U.S. Cl. 362—226** **6 Claims**



1. A quartz light fixture comprising: a base unit having side walls and a base portion; a top surface of said base portion from which said side walls extends, lamp receiving socket means secured to said top surface; a reflector assembly including a portion seating on a gasket provided between said reflector assembly portion and a top surface of said side walls, said reflector assembly portion surrounding said lamp socket and means for releasably coupling said reflector assembly portion to said base portion.

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**4,315,303**

**DC CONVERTER**

**Donald W. Snyder, Napa, Calif., assignor to Real Gas & Electric Company, Inc., Santa Rosa, Calif.**

**Filed Dec. 13, 1979, Ser. No. 103,371**

**Int. Cl.³ H02M *3/335***

**U.S. Cl. 363—21** **6 Claims**

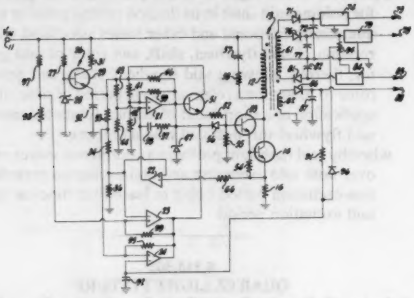
1. A converter circuit for producing low voltage regulated DC output current from a DC input that may vary widely with time comprising

a transformer having a primary winding connected in series with a switch and a resistor across an input,

a plurality of comparators with a first comparator connected in an oscillator circuit to said input and to control said switch whereby current through the primary winding of said transformer pulses at oscillator frequency and a second comparator connected for control from the juncture of said switch and resistor and having an output connected in said oscillator circuit to limit successive oscillation pulse durations for peak current protection,

said transformer also having at least one secondary winding connected to an output circuit including a diode and

capacitor for the transfer of energy, a termination of each current pulse in the transformer primary winding, and



a connection from said output circuit to control a third comparator having the output coupled to control said switch for limiting power in the output circuit.

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**4,315,304**

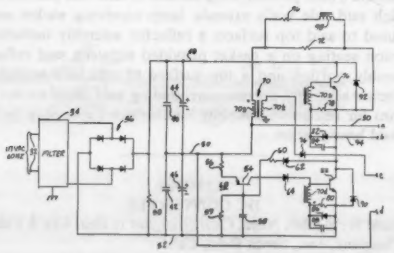
## STARTING CIRCUIT FOR A HIGH FREQUENCY MAGNETIC AMPLIFIER POWER SUPPLY

**Alejandro Marez, and Jon J. Spykerman, both of Fort Worth, Tex., assignors to Kyber Engineering, Inc., Fort Worth, Tex.**

**Division of Ser. No. 864,771, Dec. 27, 1977, abandoned. This application Nov. 6, 1979, Ser. No. 91,791**

**Int. Cl.³ H02P *1/02***

**U.S. Cl. 363—49** **5 Claims**



1. A starting circuit for generating an output pulse to initiate an oscillator circuit, the oscillator circuit including first and second transistors, having a common connection as an output terminal, comprising in combination:

a transistor having one electrode connected to the base electrode of one transistor of the oscillator circuit and a second electrode as an input terminal,

voltage supply means for generating a voltage at a first terminal to the input terminal of said transistor,

a capacitor connected to a third electrode of said transistor and to a second terminal of said voltage supply means, and

a resistor connected between the interconnection of the first and second transistors of the oscillator circuit and the interconnection of the third electrode of said transistor with said capacitor to charge said capacitor to reverse bias said transistor.

**4,315,305**

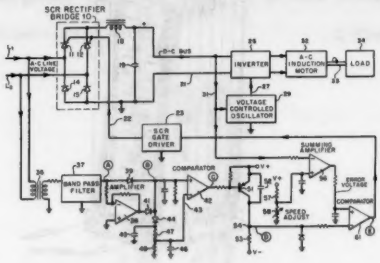
## CONTROLLED D-C POWER SUPPLY

**Edward C. Siemon, Newfield, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.**

**Filed Sep. 12, 1979, Ser. No. 75,307**

**Int. Cl.³ H02P *13/26***

**U.S. Cl. 363—88** **3 Claims**




1. A controlled d-c power supply for rectifying applied a-c line voltage to develop therefrom d-c voltage of a desired magnitude, the a-c line voltage being subject to undesired amplitude variations, comprising:

an SCR rectifier bridge, having at least two SCR's, for rectifying the a-c line voltage to produce d-c voltage of a magnitude determined by the conduction angle of the SCR's during each half cycle of the a-c line voltage;

pulse generating means, responsive to the a-c line voltage, for developing a ramp-shaped pulse during each half cycle of the a-c line voltage;

control means for utilizing said ramp-shaped pulses to trigger said SCR's into conduction at a desired phase angle, following the beginning of each half cycle of the a-c line voltage, thereby to control the conduction angle in order to establish the d-c voltage at a selected desired amplitude level;

and regulating means, included in said pulse generating means, for maintaining a constant pulse width for said ramp-shaped pulses despite wide variations in the a-c line voltage, thereby rendering said control means immune to line voltage fluctuations,

said pulse generating means including a band pass filter for attenuating, in the a-c line voltage, frequencies above and below the fundamental commutating frequency, while at the same time introducing no phase shift to that fundamental frequency.

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**4,315,306**

## HIGH-VOLTAGE GENERATING DEVICE

**Franciscus Tol, and Albertus B. A. Baggermans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Jan. 28, 1980, Ser. No. 115,971**

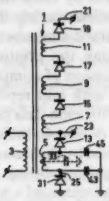
**Claims priority, application Netherlands, Feb. 19, 1979, 7901280**

**Int. Cl.³ H02M *7/06***

**U.S. Cl. 363—126** **7 Claims**

1. A high-voltage generating device comprising, a transformer having a primary coil and a secondary coil which is divided into a plurality of sections, a plurality of diodes, means connecting the end of each section, except for the end of the last section, to the anode of a diode, the cathode of which is connected to the beginning of the next section, means connecting the end of the last section to the anode of a diode whose cathode is connected to a high-voltage lead, means connecting the cathode of at least one of the other diodes to a tapping lead, means connecting the beginning of the first section to the

cathode of a diode whose anode is connected to a point of fixed potential, and means connecting the beginning and the end of



the first section to the point of fixed potential via first and second capacitors, respectively.

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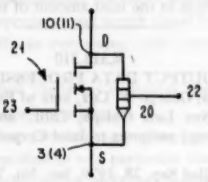
**4,315,307**

## SWITCHING DEVICE AND SWITCHED-TYPE POWER SUPPLY USING THE SAME

**Christian Jacquart, Gattieres, France, assignor to International Business Machines Corp., Armonk, N.Y.**

**Filed Jun. 2, 1980, Ser. No. 155,288**
**Claims priority, application France, Jun. 12, 1979, 79 15736**
**Int. Cl.³ H02M *7/537***
**U.S. Cl. 363—134** **3 Claims**




1. A switching device having an ON (closed) position and an OFF (open) position and controlled by control signals, comprising,

a bipolar transistor and timing means connected to the base of the bipolar transistor to apply a first control signal at a first level to cause said transistor to turn ON and at a second level to cause said transistor to turn OFF,

a field effect transistor; means connecting the collector and the emitter of said bipolar transistor to the drain and to the source of said field effect transistor; and means connected to the gate of the field effect transistor to apply a second control signal that has the same frequency as the first, said second control signal being applied at a third level for causing said field effect transistor to turn ON and at a fourth level for causing said field effect transistor to turn OFF, the time interval during which said second control signal is at said third level being longer than the time interval during which said first control signal is at said first level.

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**4,315,308**

## INTERFACE BETWEEN A MICROPROCESSOR CHIP AND PERIPHERAL SUBSYSTEMS

**Daniel K. Jackson, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.**

**Filed Dec. 21, 1978, Ser. No. 972,007**
**Int. Cl.³ G06F *13/00***
**U.S. Cl. 364—200** **9 Claims**

1. A bus interface unit for use in combination with a microprocessor interface of the type having

a bidirectional multiline bus for carrying address bits, control bits and data bits, said bus having a total number of lines which is less than the total number of bits comprising said address;

an output line (ISA);

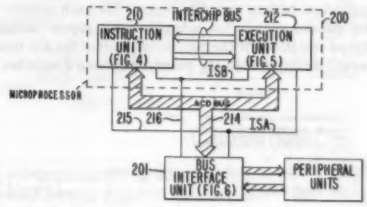
an input line (ISB);

means connected to said bus, operative during a first cycle for placing a first number of bits of said address on a first number of said bus lines, and a control specification specifying the direction of data transfer and the amount of data to be transferred, said control specification being placed on a second number of said bus lines; and,

means connected to said bus operative during a second cycle following said first cycle for placing a second number of bits of said address on said first number and said second number of said bus lines, said data transfer to take place, to or from a location specified by said address, during cycles subsequent to said first and second cycles;

said bus interface unit comprising:

logic means connected to said output line (ISA) and to said first number and said second number of said bus lines, said logic means including first and second address registering means, said logic means operative in response to said




output line (ISA) and to said first number of bits of said address on said first number of bus lines and to said control specification of said second number of bus lines, during said first cycle, for decoding said control specification and for registering said first number of bits of said address, in said first address registering means, said logic means being further operative in response to said output line (ISA) during said second cycle for registering said second number of bits of said address, in said second address registering means, whereby a complete address comprised of said first and second number of bits is registered by the end of said second cycle;

first means connected to said logic means and to said multiline bus for controlling the direction of said data transfer on said multiline bus; and,

second means connected to said logic means and to said multiline bus for controlling the amount of data transferred on said multiline bus,

said first and second controlling means being operative in accordance with control information contained in said control specification.

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**4,315,309**

## INTEGRATED MEDICAL TEST DATA STORAGE AND RETRIEVAL SYSTEM

**Robert D. Coli, 470 Tollgate Rd., Warwick, R.I. 02886**

**Filed Jun. 25, 1979, Ser. No. 51,714**
**Int. Cl.³ G06F *15/42***
**U.S. Cl. 364—200** **30 Claims**

1. Apparatus for generating, storing and reporting medical test data resulting from the performance of various medical tests selected from a predetermined set of known medical tests which are divisible into subsets of tests useful to patient treatment personnel in diagnosing and treating organ system related diseases, such tests being conducted on a plurality of medical patients which collectively define a continually changing patient population, said apparatus comprising

(a) electronic data generating means for generating a digital

electrical signal field for each test conducted on the patient population, said each field including

(1) a first set of electrical digital signals identifying a particular medical test from the predetermined set of known medical tests,

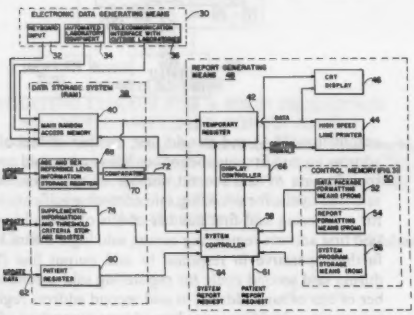
(2) a second set of electrical digital signals identifying the results of the test identified by said first set,

(3) a third set of electrical digital signals identifying the date on which the test identified by said first set was conducted, and

(4) a fourth set of electrical digital signals identifying the patient for whom the test identified by said first set was conducted;

(b) data storage means for receiving and storing all said digital electrical signal fields generated by said electronic data generating means on the entire patient population, said data storage means including a random access memory means connected with said electronic data generating means for permitting said digital electrical signal sets stored by said data storage means to be retrieved randomly in accordance with the information identified by said sets; and

(c) report generating means for generating periodically individual patient test data reports for each patient within the patient population wherein each report includes all stored test data for the particular patient for the total time period during which the patient has been a member of the




patient population and wherein each report is organized to present the cumulative test data in a highly compact pattern of data packages wherein each data package includes only results of tests making up a particular organ system disease related subset of tests, said report generating means including

(1) printing means responsive to control signals for producing the individual patient reports by converting digital electrical signals representative of the type of tests and of the dates and results of such tests into visually perceptible indicia appearing in an orthogonal pattern of rows and columns on a hard copy report,

(2) data package formatting means for generating successive data package formatting signals to cause results of repeated performance of the same test on the same patient to appear in a single column of a single data package and to cause the results of all tests which are included in the data package and which were performed on the same patient on the same date to appear in a single row of the same data package,

(3) report formatting means for generating an identical succession of report formatting electrical signals each time a patient report is produced by said printing means for identifying the tests and sequence of tests included in each successively formed data package and for identifying the sequence in which said data packages are to appear in each patient report, and

(4) controller means connected with said data storage means, said printing means, said data package formatting means and said report formatting means, for generating printer control signals which cause the printing means to form a patient report for each patient within the patient population by retrieving all test data accumulated on each patient during the entire period that the patient has remained a member of the patient population and for causing the printing means to form a predetermined succession of comprehensive data packages in accordance with said report and data package formatting signals with each data package containing an orthogonal pattern of visible indicia including the results of all tests defined by the data package which were conducted on the patient during the entire period in which the patient has remained a member of the patient population and with the visible indicia in each column representing said second sets of all signal fields having identical first sets stored in said data storage means for such patient and for generating printer control signals which cause the printer to print the visible indicia in each column of each data package in chronological order as determined by said fourth set of each corresponding signal field, whereby each successively printed patient report supersedes all prior reports and includes all stored medical test results organized in a compact comprehensive organ system disease related pattern in which the order of the data packages and the order of tests appearing in each package is identical in all reports to assist patient treatment personnel to assimilate and understand organ system disease related test information in the least amount of time.

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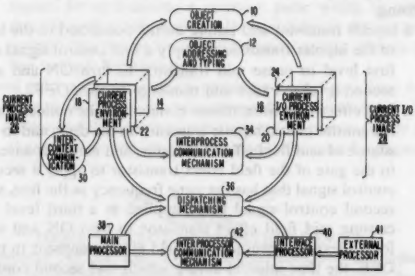
**4,315,310**

## INPUT/OUTPUT DATA PROCESSING SYSTEM

**John A. Bayliss; George W. Cox, both of Portland, Oreg.; Bert E. Forbes, San Luis Obispo, Calif., and Kevin C. Kahn, Portland, Oreg., assignors to Intel Corporation, Santa Clara, Calif.**

**Filed Sep. 28, 1979, Ser. No. 79,991**
**Int. Cl.[3] G06F *3/00, 15/16***
**U.S. Cl. 364—200** **11 Claims**




1. For use in a data processing system including a main processor of a type capable of executing an operation by means of an operator specified in an instruction, said operator being one of a set of main processor operators executable on said main processor, said system having instruction objects defining an operation, and data objects, said instruction objects and data objects being stored in a memory which can be shared by a number of processors, the instruction objects and data objects accessible to said main processor existing in an address space in said memory associated with said main processor,

an interface processor which enables an external processor to interface with said memory and said main processor, said external processor being capable of referencing an I/O address space associated with said external processor, said interface processor comprising:

means for receiving addresses and commands from said external processor, one of said commands being a particular command including bits in said particular command specifying a particular operator;

recognizing means connected to said receiving means for comparing said addresses from said external processor with address registers associated with each of a number of address blocks, each of said blocks falling within a predetermined address range within the I/O address space of said external processor,

said recognizing means including means for generating match signals, one match signal for each of said address blocks,

one of said address blocks including command register means for receiving said particular command from said external processor;

means connected to said recognizing means responsive to said match signals for mapping said addresses within said address range from the I/O address space of said external processor onto the address space of said main processor;

function request means connected to said command register means,

said function request means including means for executing a set of interface processor operators comprising access environment manipulation operators and communication operators in response to said match signal from said one of said address blocks containing said command register means,

said set of interface processor operators being a subset of said main processor operators,

one of said interface processor operators being said particular operator specified in said particular command,

said function request means including means responsive to said bits in said particular command for executing said particular operator,

whereby said external processor is able to make a request for the execution of said particular operator by said interface processor by sending an address corresponding to the address block in which said command register means is contained and writing a copy of said particular command into said command register means,

said function-request means thereby being capable of being invoked by commands contained in instructions within the I/O address space of said external processor;

first interface means for connecting said mapping means and said function-request means with said memory; and,

second interface means for connecting said address and command receiving means with said external processor;

whereby said external processor is provided with a window, via said recognizing means, into the address space of said main processor,

said interface processor operators included in said function request means providing instruction set extensions to the operator set of said external processor to thereby allow a process executing on said external processor, via invoking execution of said communication operators on said function-request means, to send messages to said main processor, and to receive messages from said main processor, and via invoking execution of said access environment manipulation operators on said function-request means, to manipulate objects within said address space of said main processor.

**4,315,311**

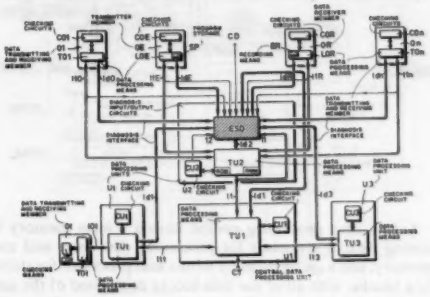
## DIAGNOSTIC SYSTEM FOR A DATA PROCESSING SYSTEM

**Jean-Marie Causse, Carrieres, and Andre F. M. Sarre, Boulogne, both of France, assignors to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France**

**Continuation of Ser. No. 626,186, Oct. 28, 1975, abandoned. This application Dec. 7, 1979, Ser. No. 101,071**

**Int. Cl.³ G06F *11/00***

**U.S. Cl. 364—200** **5 Claims**



1. In a data processing system including at least one transmitter member having program storage means, data processing means and checking circuits for the transmitter member; at least one data processing unit having data processing means capable of executing programs stored in the transmitter member and having checking circuits for the processing unit; and a receiver member having means for recording data resulting from the execution of programs by the processing unit, data processing means, and checking circuits for the receiver member; a diagnosis system comprising:

the program storage means of the transmitter member including means for storing diagnosis programs for the diagnosis of the data processing means of the transmitter member, the data processing means of the one data processing unit, and the data processing means of the receiver member;

the data processing means of the one processing unit being capable of executing diagnosis programs stored in the program storage means of the transmitter member;

the recording means of the receiver member including means for recording data resulting from execution in the one processing unit of diagnosis programs stored in the program storage means of the transmitter member;

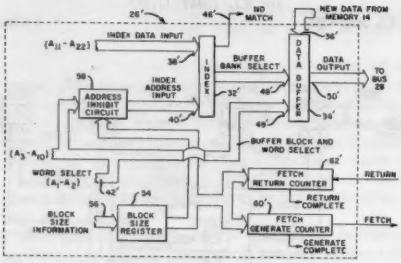
each of the diagnosis programs stored in the program storage means of the transmitter member including instructions to allow the one processing unit to introduce test data into a data processing means to be diagnosed and to allow the one processing unit to transfer data resulting from the tests to the recording means of the receiver member; and

a diagnostic input/output circuit responsive to error signals from the various checking circuits and operable in a diagnostic mode to read appropriate diagnostic programs from the program storage means of the transmitter member for execution by the data processing means of the one data processing unit, to connect the data processing means of the one processing unit to the data processing means to be diagnosed for the transmission of test data and instructions, and to connect the data processing means of the data processing unit to the recording means of the receiver member for recording results of diagnosis.

## 4,315,312
## CACHE MEMORY HAVING A VARIABLE DATA BLOCK SIZE

Carson T. Schmidt, Poway, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 19, 1979, Ser. No. 105,186
Int. Cl.[3] G06F *13/00*
U.S. Cl. 364—200 8 Claims




1. In a data processing system having a main memory for storing data, a processor for processing data from said main memory, and a cache memory within said processor for storing data blocks, with all of the data blocks comprised of the same number of data words, the improvement wherein the number of data words in the data blocks may be varied and wherein said cache memory comprises:

a data buffer for receiving and storing data blocks from said main memory with the data blocks in data buffer arranged in banks with each bank having a plurality of data blocks;

a set associative index for storing an address block corresponding to each data block stored in said data buffer, each address block comprised of bits in the main memory address of the corresponding data block, said index including an index data input for receiving main memory address bits for comparison with the main memory address bits of the address blocks stored in said index, and an index address input for receiving index address input bits selecting a set of address blocks having the main memory address bits for comparison with the main memory address bits at said index data input; and

inhibit means for inhibiting selected ones of the index address input bits at said index address input in order to reduce the number of addressable address blocks in said index so that the number of data words in the corresponding data blocks in said data buffer may be increased.

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## 4,315,313
## DIAGNOSTIC CIRCUITRY IN A DATA PROCESSOR

Rolfe D. Armstrong, Escondido, and Dennis A. Walsh, San Marcos, both of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 27, 1979, Ser. No. 107,735
Int. Cl.[3] G06F *11/00*
U.S. Cl. 364—200 6 Claims

5. In a data processing system having a processor with a plurality of pipelined stages and a control store for storing microinstructions to be passed through the stages in order to be executed in said processor, the improvement comprising:

a control register associated with at least one of the stages, said control register for holding a control store address associated with the microinstruction in its associated stage;

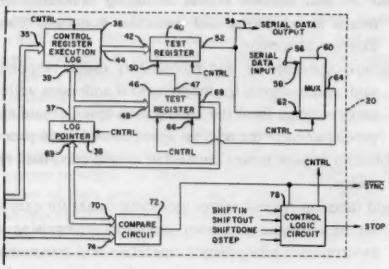
a last-in-first-out log having a plurality of storage locations and connected for storing the control store address of each microinstruction executed by the processor;

a log pointer for providing a log address of each storage location in said log, said log pointer connected to said log so that the log address of a storage location is provided by said log pointer to said log when a control store address is to be stored in said log and when a control store address is to be read from said log;

a first test register having a parallel data input connected for receiving the control store address stored in one of the storage locations in said log;

a second test register having a parallel data input connected for receiving the log address provided by said log pointer and having a parallel data output;

an external serial data output, said first and said second test registers interconnected, with a serial output of one of said first and said second test registers connected to said external serial data output so that a control store address in one of the storage locations in said log and the log address of that storage location in said log pointer are serially read from said first and second registers and provided at said external serial data output;




a compare circuit connected for receiving data stored in said second test register from its parallel data output and for receiving the control store address of a microinstruction executed by the processor and held in the control register; and

an external serial input connected for providing data in the form of a preselected control store address to said second test register so that when the microinstruction associated with the preselected control store address is executed by the processor, said compare circuit provides a signal indicating a match of the data in said second test register and the control store address of the microinstruction executed by the processor.

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## 4,315,314
## PRIORITY VECTORED INTERRUPT HAVING MEANS TO SUPPLY BRANCH ADDRESS DIRECTLY

Paul M. Russo, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 865,796, Dec. 30, 1977, abandoned. This application Dec. 19, 1979, Ser. No. 105,121
Int. Cl.[3] G06F *9/42*
U.S. Cl. 364—200 8 Claims

1. In a computer system comprising a main memory storage means having a main program and sub-routines, control logic means, a main program counter, and means for receiving source identifying service requests from external sources, means for accessing and executing a sub-routine requested by and in response to each service request and with said accessing and executing means comprising:

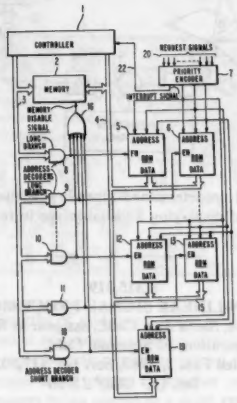
first storage means containing first sub-routine addresses addressable by said service requests;

register means containing a given instruction address;

said control logic means responsive to a received service request to enable said register means to replace said main program counter as the system program counter and to point to said given instruction;

said control logic means further comprising means responsive to the execution of said given instruction to alter the contents of said register means in a predetermined manner;

said first storage means further comprising first enabling means and responsive to said altered contents of said register means and to said received service request for supplying the requested sub-routine address to said control logic means;




said control logic means responsive to the reception of said requested sub-routine address to load said requested sub-routine address into said register means which responds thereto to function as the active program counter for the execution of said requested sub-routine.

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**4,315,315**

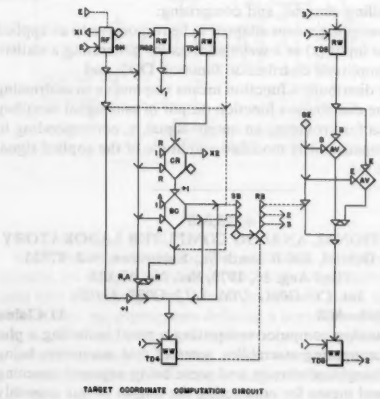
**GRAPHICAL AUTOMATIC PROGRAMMING**

**Alexander Kossiakoff, Brookville, Md., assignor to The Johns Hopkins University, Baltimore, Md.**

**Filed Mar. 9, 1971, Ser. No. 122,494**

**Int. Cl.³ G06F *15/20***

**U.S. Cl. 364—300** **34 Claims**




1. A method of designing a computer program from a representation of the flow of data as a data flow circuit in a form directly analogous to an electronic circuit diagram, in which a computing machine performs machine functions in the design process in lieu of human mental steps in designing said computer program, which comprises the steps of:

representing such program as a data flow circuit, and

storing the data flow circuit in the memory of a general purpose digital computer,

the representation making clear the operations to be performed by said computer on each data variable in said data flow circuit as well as showing conditional and unconditional logical branching in such circuit so that the method can be used to efficiently organize the operations and minimize redundancy therein.

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**4,315,316**

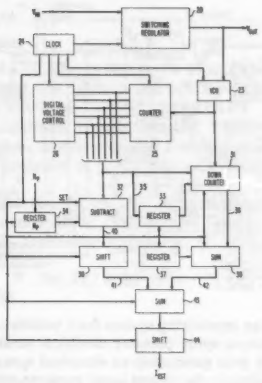
**DIGITAL ARRANGEMENT FOR DETERMINING AVERAGE CURRENT OF A CIRCUIT BY MONITORING A VOLTAGE**

**Victor B. Boros, New York, N.Y., and Frederick E. Thau, Teaneck, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Nov. 29, 1979, Ser. No. 98,475**

**Int. Cl.³ G05F *1/56***

**U.S. Cl. 364—483** **7 Claims**




4. A signal monitoring system for estimating an average current of a circuit by monitoring a voltage output of the circuit comprising:

first means for deriving a first numerical value functionally related to an average of the voltage output,

said first means comprising a voltage-to-frequency converter and counting means for counting cycles of a signal frequency generated by said voltage-to-frequency converter, whereby a numerical value proportional to an average of the voltage output is obtained,

second means for deriving a second numerical value functionally related to a differential of an average of the voltage output;

said second means comprising a down counter responsive to be decremented by said voltage-to-frequency converter and first register means to preset said down counter with a numerical value generated by said voltage-to-frequency converter in a previous cycle of operation of the signal monitoring system,

arithmetical means responsive to said first and second means to weigh and combine said first and second numerical value in accord with a relation

$$A\hat{V} + B\frac{d\hat{V}}{dt} = \hat{I}$$

to obtain an estimated output current value, wherein A and B are constants determined by physical parameters of the circuit, said arithmetical means including subtract means responsive to the counting means for determining a numerical value proportional to a deviation of the average output voltage from a desired output voltage value, summing means for weighting numerical values derived by the down counter and said subtract means, and shifting

means responsive to said summing means to adjust count values of the summing means to obtain a numerical value proportional to an average output current of a circuit.

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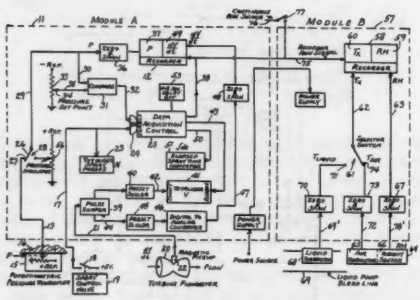
## 4,315,317
## PESTICIDE SPRAY MONITORING SYSTEM FOR SPRAY VEHICLES

**Richard D. Orchard, Juneau, Ak.; Kurt L. Barbee, Lafayette, Colo.; Bradford S. Whiting, Corvallis, Oreg.; William C. Heussy, deceased, late of Shedd, Oreg., and by Loyal L. Pavenstedt, executrix, Portland, Oreg., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.**

**Filed Dec. 4, 1979, Ser. No. 100,081**
**Int. Cl.³ B05B *12/00***
**U.S. Cl. 364—510** **18 Claims**




1. A spray monitoring system for a vehicle comprising spray control means, spray pressure electrical sensing means in the spray flow path generating an electrical spray pressure signal corresponding to the sensed spray pressure responsive to emission of spray fluid from the vehicle, recorder means including a pressure indicator and means to record the display of the pressure indicator, circuit means connecting said sensing means to the pressure indicator, threshold pressure means to establish a pressure threshold electrical signal, means to compare the sensed electrical spray pressure signal with said threshold signal, circuit means to enable said recorder means responsive to activation of said control means, and means to enable said recorder means to continuously record the display of the spray pressure indicator while said sensed pressure signal is greater than said pressure threshold signal.

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## 4,315,318
## METHOD AND APPARATUS FOR PROCESSING A RADIATION IMAGE

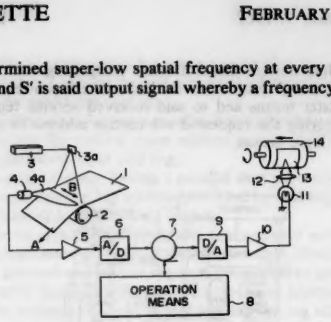
**Hisatoyo Kato; Masamitsu Ishida, and Seiji Matsumoto, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Dec. 18, 1979, Ser. No. 104,855**
**Claims priority, application Japan, Dec. 26, 1978, 53-163571; Jul. 11, 1979, 54-87800; Nov. 22, 1979, 54-151398; Nov. 22, 1979, 54-151400; Nov. 22, 1979, 54-151402**
**Int. Cl.³ H04N *1/40***
**U.S. Cl. 364—515** **16 Claims**

1. A method of recording an enhanced radiation image in a radiation image recording system comprising the steps of: scanning a stimulable phosphor with a stimulating beam; reading out and converting radiation image information recorded in said stimulable phosphor into an original image electric signal upon stimulation thereof; processing said original signal to produce an output signal in accordance with

$$S' = Sorg + \beta(Sorg - Sus)$$

where Sorg is said original image signal, $\beta$ is an emphasis coefficient, Sus is an unsharp mask signal corresponding to a predetermined super-low spatial frequency at every scanning point, and S' is said output signal whereby a frequency component above said predetermined super-low spatial frequency is emphasized; and displaying a visual image in response to said output signal.

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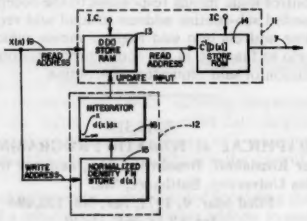
## 4,315,319
## NON-LINEAR SIGNAL PROCESSOR

**Stanley A. White, Santa Ana, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.**

**Filed Feb. 1, 1980, Ser. No. 117,502**
**Int. Cl.³ G06F *15/36***
**U.S. Cl. 364—571** **14 Claims**




2. A device for the correction of signal distortion occurring in a signalling channel, and comprising:

signal sampling means adapted to be responsive to an applied signal input (x) as a write-address for generating a statistical amplitude distribution function D(x); and

inverse distribution function means responsive to addressing by the distribution function output of said signal sampling means for providing an output signal, y, corresponding to a compensatorily modified amplitude of the applied signal input (x).

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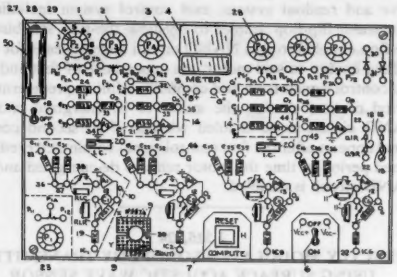
## 4,315,320
## EDUCATIONAL ANALOG COMPUTER LABORATORY

**Edwin Z. Gabriel, 318-B South St., Eatontown, N.J. 07724**

**Filed Aug. 16, 1979, Ser. No. 67,123**
**Int. Cl.³ G06G *7/06, 7/32;* G09B *23/02***
**U.S. Cl. 364—808** **11 Claims**

1. An analog computer comprising a panel including a plurality of computing assemblies, some of said assemblies being exposed integrator circuits and some being exposed summing circuits, and means for connecting the output of one assembly to the input of another assembly, each said assembly further comprising exposed coil spring terminals, one Op amplifier of a quad Op amplifier integrated circuit, diagram of an Op amplifier and associated artwork to show between which of two of said spring terminals a discrete passive-component is to be placed for solution of a differential equation, and wherein said panel further comprises a plurality of coefficient potentiometers, an on/off switch for supply voltage application to said quad Op amplifiers, patch cords; said spring terminals being the means for interconnecting selected said computing assem-

blies for forming an analog model of a physical system, each of said terminals enabling several patch cords to be connected to it as well as enabling magnets to be used at the end of each of said patch cords for electrically connecting said spring terminals; said computing assemblies arranged on said panel to



minimize the lengths of said patch cords when attempting to solve a differential equation to avoid confusion on the part of the user, said summing circuits being placed in one row, said integrator circuits being placed in another parallel row and said potentiometers being placed in a third parallel row.

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**4,315,321**

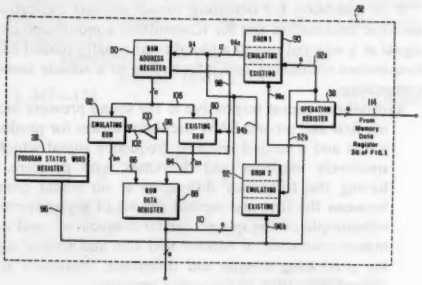
## METHOD AND APPARATUS FOR ENHANCING THE CAPABILITIES OF A COMPUTING SYSTEM

**William L. Parks, III, Bethesda, Md., and Clifford Harwood, Wheaton, Ill., assignors to The Kardios Systems Corporation, Gaithersburg, Md.**

**Filed Jun. 16, 1978, Ser. No. 916,255**

**Int. Cl.³ G06F *9/26***

**U.S. Cl. 364—900** **5 Claims**



1. A bimodal processor for executing virtually simultaneously, on a time-shared basis, and without pre-processing, at least two microprograms, execution of each given one of said at least two microprograms defining a corresponding processing mode of said processor, said processor comprising:

a main memory containing a first microprogram including operational codes corresponding to a first distinct instruction set,

data register means connected to said main memory for reading out said operational codes therefrom,

first read only memory means for holding operational instructions from said first distinct instruction set to be executed by said processor,

second read only memory means for holding a second microprogram comprising further operational instructions from a second distinct instruction set different from said first distinct instruction set,

enabling means responsive to occurrence of each said corresponding processing mode of said processor for automatically issuing a selective enabling signal, and

decode unit means responsive to said selective enabling signal for selectively converting said operational codes, read out from said main memory by said data register means, into either addresses of corresponding said operational instructions in said first read only memory means or addresses of corresponding said further operational instructions in said second read only memory means, and for selectively accessing either said corresponding operational instructions in said first read only memory means or said corresponding further operational instructions in said second read only memory means, whereby said bimodal processor automatically and switchably executes, without pre-processing, one of said first microprogram and said second microprogram in accordance with occurrence of respective said corresponding processing mode of said processor.

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**4,315,322**

## MICROIMAGE REGISTRATION SYSTEM FOR LOADING AND/OR UPDATING MICROFICHES IN MICROFILM CASSETTE LIBRARY

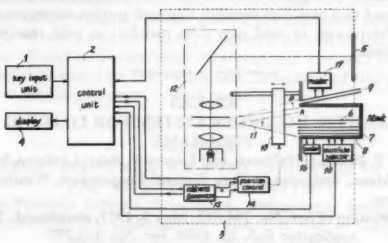
**Mikio Osaki, Kashihara; Hiroshi Kamada, Yamatokoriyama; Kohichi Kakimoto, Matsuyama, and Toshiaki Tabuchi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Continuation of Ser. No. 600,137, Jul. 30, 1975, abandoned. This application Jul. 3, 1979, Ser. No. 54,451**

**Claims priority, application Japan, Jul. 30, 1974, 50/88842; Aug. 2, 1974, 50/89222**

**Int. Cl.³ G06F *3/00***

**U.S. Cl. 364—900** **7 Claims**



1. Means for registering microimages in a microfilm retrieval library system to update said system wherein a plurality of cassettes are stored, each of said cassettes containing a predetermined number of film members, each of the latter carrying a predetermined number of microimages and each of said cassettes having a precoded cassette identity number and each of said film members having a precoded film identity number, said system comprising an optical viewing screen for projecting thereon information recorded on each of said microimages and an X-Y position control associated with said viewing screen for receiving a said film member and controlling the position of said respective microimages thereon for projecting purposes, said means for registering new microimages comprising:

receiving means for receiving a new film member to be loaded into said system and a cassette for retaining said new film member therein;

storage means for registering the identity of each film member, each microimage identity thereon, the category of information contained therein, and the cassette identity thereof when a new film member is loaded into said system;

a key input means selectively activated subsequent to receipt of a said new film member in said receiving means for introducing key words into said system corresponding to

a given category of information contained in the microimages in said new film member;

an X-Y coordinate counter enabled by said key input means and presettable at a given count subsequent to receipt of said new film member in said X-Y position control, of which the count provides a control constraint for said X-Y position control;

a first reader enabled by said key input means for reading out a said precoded cassette identity number from and corresponding to said cassette for retaining said new film member subsequent to receipt of said new film member in said receiving means;

a second reader enabled by said key input means for reading out said precoded film identity number from and corresponding to said new film member subsequent to receipt of said new film member in said receiving means;

said X-Y position control means being responsive to said key input means for positioning a first microimage for projection;

frame address means receiving said count from said X-Y coordinate counter and responsive to said key input means to constrain said X-Y position control means to position each additional microimage on said new film member for projection and for reading out the count of said X-Y coordinate counter as an image identity number corresponding to each said microimage positioned for projection on said viewing screen; and

control means responsive to said key input means, for interconnecting said storage means, said first and second readers and said frame address means for putting into said storage means within said system the said key word from said key input means, the said precoded cassette identity number from said first reader, the said precoded film identity number from said second reader, and the said microimage identity number from said frame address means to register each of said microimages and thereby load said new film member into said system subsequent to the receipt of said new film member in said receiving means.

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**4,315,323**

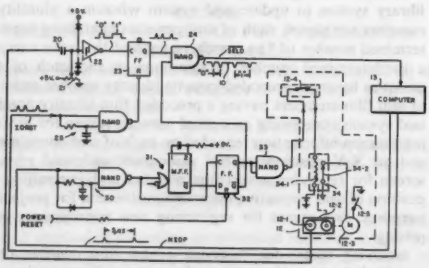
## CASSETTE RECORDER SYSTEM FOR LOADING PROGRAMS

**Larry F. Bronisz, Holliston, and Eugene V. Sahr, Littleton, both of Mass., assignors to Data General Corporation, Westboro, Mass.**

**Continuation of Ser. No. 794,015, May 5, 1977, abandoned. This application Feb. 22, 1980, Ser. No. 123,757**

**Int. Cl.³ G06F *3/08***

**U.S. Cl. 364—900** **2 Claims**




1. A control system for reading data stored on a magnetic tape into a computer comprising a tape drive and readout system including a motor, said magnetic tape storing a program thereon represented by sine waves of two different audio frequencies, one frequency representing a "0" bit and the other frequency representing a "1" bit, said magnetic tape supported by said tape drive system for movement upon operation of said motor, a Schmitt trigger circuit coupled to said tape drive and readout system to a pulse waveform representing the "1" and "0" bits represented on said tape, a flip-flop coupled to the Schmitt trigger and a NAND circuit coupled to said flip-flop, a computer, said NAND circuit coupled to said computer for providing program data signals to said computer, said flip-flop resettable by a timing signal from said computer, said computer providing control signals to control the operation of the tape drive and readout system, said control system including a monostable flip-flop coupled to a bistable flip-flop, said bistable flip-flop coupled to said NAND circuit and to means for controlling energy to said motor, the appearance of first and second control signals from said computer within a predetermined period of time causing the motor to be energized and the NAND circuit to be enabled whereas if no second control signal appears after the first control signal within said predetermined period of time the motor remains de-energized and the NAND circuit is disabled.

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**4,315,324**

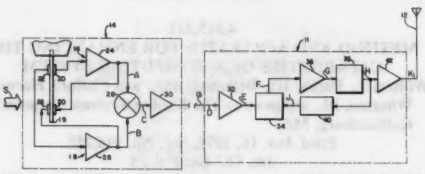
## DIRECTLY MODULATED SONOBUOY TRANSMITTER USING SURFACE ACOUSTIC WAVE SENSOR

**Michael T. Junod, and Albert M. Bates, both of Southampton, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Sep. 11, 1980, Ser. No. 186,354**

**Int. Cl.³ H04B *1/59***

**U.S. Cl. 367—3** **3 Claims**



1. A sonobuoy for detecting sound pressure indicative of acoustic information and for transmitting a modulated carrier signal at a selected one of a plurality of equally spaced carrier frequencies containing said information to a remote receiver, comprising:

hydrophone means responsive to the sound pressure including first and second SAW oscillator means for producing a first and a second resonant frequency signal which respectively increases and decreases with pressure, and having the frequency difference at no sound pressure between the first and second signals of a predetermined submultiple of the spaced carrier frequencies, and mixer means connected to receive said first and second signals for producing a sum and difference frequency signal thereof indicative of the sound pressure;

cable means having low pass filter characteristics connected to receive the sum and difference frequency signal for passing only the difference signal; and

buoyant transmitter means connected to receive and multiply the difference signal to produce the carrier signal at the selected frequency, and for transmitting the carrier signal to the remote receiver.

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**4,315,325**

## ECHO RANGING PULSE DISCRIMINATION CIRCUIT

**Frederick K. Blades, Boulder, Colo., assignor to PureCycle Corporation, Boulder, Colo.**

**Filed Jul. 2, 1980, Ser. No. 165,254**

**Int. Cl.³ G01S *15/04***

**U.S. Cl. 367—98** **6 Claims**

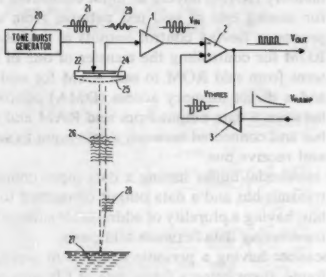
1. An echo ranging system comprising:

means for generating and transmitting a pulse;

means for receiving a reflection of said transmitted pulse and converting said reflection into an input signal; and

circuit means for discriminating said received pulse from noise and for providing a signal in response to said received pulse, said circuit comprising:

means for providing a threshold level varying with time, means for comparing said input signal to said threshold




level, means for providing an output signal when said input signal exceeds said threshold level and means for inverting the relative polarity of said threshold level with respect to said input signal when said input signal exceeds said threshold level.

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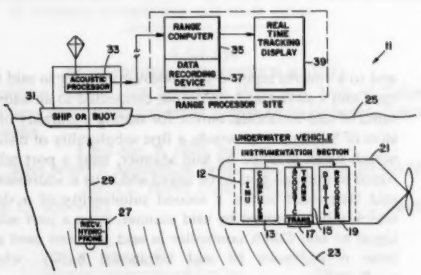
**4,315,326**

## INERTIAL MEASUREMENT UNDERWATER TRACKING SYSTEM

**Jay V. Chase, Jr., Poulsbo, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Oct. 31, 1980, Ser. No. 202,518**
**Int. Cl.³ H04B *11/00***
**U.S. Cl. 367—134** **14 Claims**




1. An underwater tracking system comprising:

(a) an underwater vehicle;

(b) an inertial measurement unit mounted on said vehicle including measuring means for measuring information from which the position of said vessel may be defined;

(c) a position device for determining the position of said vessel from the output of said inertial measurement unit;

(d) the output of said inertial measurement unit applied to the input of said position device;

(e) a transmitter; and

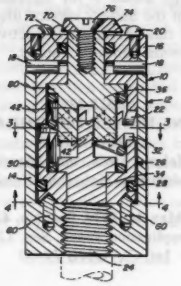
(f) the output of said position device applied to the input of said transmitter for transmission to a remote receiver for determining the position of said underwater vehicle.

**4,315,327**

## AIR OPERATED CLOCK

**Edgar W. Bremer, P.O. Box 47, Okolona, Ohio 43550**

**Filed Jul. 29, 1980, Ser. No. 173,896**
**Int. Cl.³ G04B *1/26***
**U.S. Cl. 368—65** **8 Claims**



1. In an air pressure operated clock having a housing including a cylindrical bore formed therein, a first end having a plurality of time indicator markings, a shaft rotatably mounted through an opening in said first end and an indictor arm attached to said shaft for rotation therewith, said housing having a second end including an air inlet opening communicating with said cylindrical bore, a piston rotatably and axially displaceably mounted within said cylindrical bore, the improvement comprising: a two-piece rotor mounted within said cylindrical bore, one piece of said two-piece rotor being fixedly attached to said piston, the other piece of said two-piece rotor being fixedly attached to said shaft, a key extending from one piece of said two-piece rotor, a keyway formed in the other piece of said two-piece rotor receiving said key, and motion translation means for converting axial movement of said piston to rotational movement of said piston and rotor.

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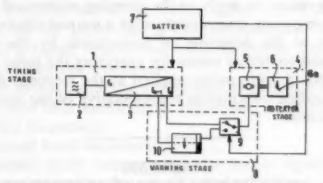
**4,315,328**

## BATTERY-DRIVEN CLOCK WITH INDICATOR OF THE END OF LIFE OF THE BATTERY

**Jean-Francois Schwab, Schwalbach, Switzerland, assignor to Quarz-Zeit AG, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Mar. 12, 1979, Ser. No. 19,817**
**Claims priority, application Fed. Rep. of Germany, Mar. 16, 1978, 2811391**
**Int. Cl.³ G04B *9/00, 19/04***
**U.S. Cl. 368—66** **11 Claims**




1. A clock driven by a battery comprising

a timing stage means for emitting a control signal of a certain frequency,

an electric indicator stage operatively connected to said timing stage means so as to receive said control signal and to indicate the clock time,

a warning stage means for detecting an approaching end of the service life of the battery constituting a warning situation,

said warning stage means for influencing the frequency of

said control signal so as to advance the clock time indicated by the indicator stage in the warning situation,

said indicator stage is an analog clock comprising clock hands, said clock hands constituting means for indicating the clock time as well as the advanced clock time in said warning situation, respectively, in response to said control signal,

said warning stage means is for increasing the frequency until the end of the battery service life, such that after a predetermined time duration respectively the clock advances by a certain constant amount.

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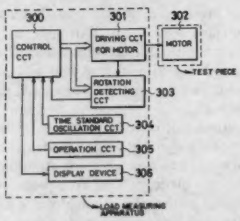
**4,315,329**

## LOAD MEASURING DEVICE FOR THE GEAR TRAIN OF A TIMEPIECE

**Akira Torisawa; Makoto Ueda, and Masaharu Shida, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan**

**Filed May 24, 1979, Ser. No. 42,073**
**Claims priority, application Japan, Sep. 12, 1978, 53/112009**
**Int. Cl.³ G04B *19/00***
**U.S. Cl. 368—76** **5 Claims**




1. A load measuring apparatus for measuring a varying load of a stepping motor of an analogue electronic timepiece having a stator, a rotor and a coil, comprising: means for producing a range of normal driving pulses having discretely different pulse widths each corresponding to a different magnitude of load on the stepping motor; pulse applying means for successively applying the normal driving pulses to the stepping motor coil; detecting means for detecting whether the stepping motor rotor has rotated or not in response to the application of each normal driving pulse; controlling means responsive to the detection by the detecting means for controlling the pulse applying means to effect the application of the normal driving pulses having the minimum pulse width capable of driving the stepping motor rotor in accordance with the load on the motor, the controlling means comprising means for producing correction driving pulses, and means for controlling the pulse applying means to apply to the stepping motor coil a correction driving pulse immediately after a normal driving pulse in response to the detection of nonrotation by the detecting means; and analyzing means for analyzing the pulse widths of the normal driving pulses applied to the stepping motor coil and providing information representative of the varying load on the motor.

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**4,315,330**

## MULTIPLE DATA RATE TESTING OF COMMUNICATION EQUIPMENT

**Norman F. Brickman, Potomac, and Bruno R. Graziano, Damascus, both of Md., assignors to IBM Corporation, Armonk, N.Y.**

**Filed Mar. 7, 1980, Ser. No. 128,057**
**Int. Cl.³ H04J *3/14***
**U.S. Cl. 370—104** **7 Claims**

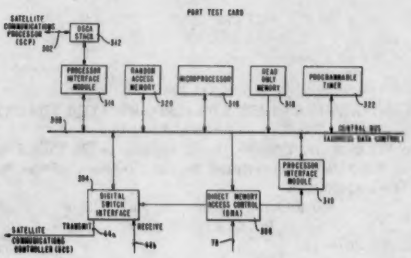
1. In a TDMA communications controller having a plurality of i input/output ports for transferring data from respective, local data users to a transmit bus and transferring data from a receive bus to said respective local users on a time interleaved basis during periodic TDMA frames, each port operating at its own data rate $R_j$, an apparatus for testing one of said ports having a data rate $R_j$ while other ones of said ports continue their communication function, comprising:

a test card including a read-only memory (ROM) for storing test patterns for each of said data rates $R_j$, a random access memory (RAM) having an input connected to said ROM, for storing one of said test patterns from said ROM, a processor having control outputs to said RAM and said ROM for controlling the transfer of one of said test patterns from said ROM to said RAM for said data rate $R_j$ and a direct memory access (DMA) control connected between a data output from said RAM and said transmit bus and connected between a data input to said RAM and said receive bus;

an intranodal buffer having a data input connected to said transmit bus and a data output connected to said receive bus, having a plurality of addressable storage locations for transferring data between said ports;

a scanner having a periodic cycle of m scans per TDMA frame, there being a frame rate of f frames per second;

a switch control memory (SCM) having an address input connected to the output of said scanner, a port select output connected to a control input to each of said ports




and to a control input to said DMA controller in said test card and a stored address output connected to an address input of said intranodal buffer, for storing a plurality of 2n slots of SCM control words, a first subplurality of n slots, which when scanned by said scanner, issue a port select signal to said one port to be tested and issue n addresses to said intranodal buffer, a second subplurality of n slots, which when scanned by said scanner, issue a port select signal to said DMA controller in said port test card and issue n addresses to said intranodal buffer, where $n=R_j/mf$;

said DMA controller transferring a plurality of said test patterns from said RAM in said test card through said accessed storage locations in said intranodal buffer to said one port to be tested, at said data rate $R_j$ in response to said outputs from said SCM;

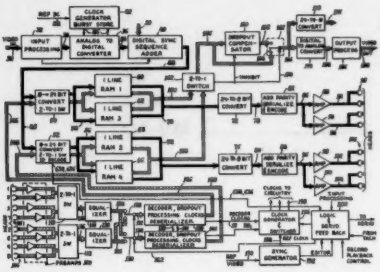
said data port under test having its said user output connected to its said user input to transfer said test patterns received on said receive bus to said transmit bus and through the accessed storage locations in said intranodal buffer to said DMA controller in said test card, at said data rate $R_j$, in response to said outputs from said SCM;

whereby ports of any data rate $R_j$ in said communications controller can be tested.

## 4,315,331
## APPARATUS FOR PROVIDING DROP-OUT COMPENSATION IN RECORDING AND REPRODUCING SYSTEMS

**Maurice G. Lemoine, and Leonard A. Pasdera, both of Redwood City, Calif., assignors to Ampex Corporation, Redwood City, Calif.**

**Filed Feb. 1, 1980, Ser. No. 117,422**
**Int. Cl.³ H04N 5/94; G06F 11/00**
**U.S. Cl. 371—31** **12 Claims**



1. Apparatus for providing substitute digital data in a stream of current television digital data, said apparatus having an input for receiving said data stream of current television digital data and an output for providing one of either the current or substitute digital data, comprising:

means for storing said current data received at said input;

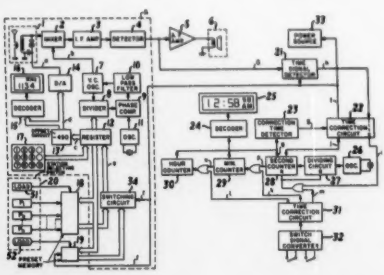
means for controlling said storing means to store current data therein in place of data that was received at said input and stored previous to said received current data, said controlling means being responsive to the occurrence of horizontal and vertical blanking intervals in the received current data and being responsive to an error signal indicating the current data is defective to inhibit storing of the received current data, said controlling means being responsive to said error signal for controlling said storing means to provide stored data at the output that represents video data at the same location within a line interval that occurred at least one multiple of 262 line intervals previous to said defective current data; and,

switching means for providing said stored data at the output in response to receiving said error signal.

## 4,315,332
## ELECTRONIC TIMEPIECE RADIO

**Ryoichiro Sakami, and Yoshihiko Hirayama, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan**

**Filed Apr. 8, 1980, Ser. No. 138,299**
**Claims priority, application Japan, Apr. 13, 1979, 54-45123**
**Int. Cl.³ H04B 1/16; G04C 11/02**
**U.S. Cl. 455—181** **5 Claims**

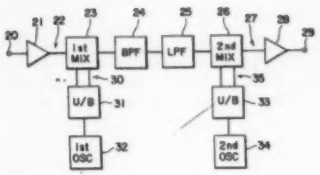


1. An electronic timepiece radio comprising: an electronic timepiece circuit including a standard signal oscillator, a time counting circuit and means for displaying a time determined by the count of the time counting circuit; a radio receiver circuit including a tuning circuit, station selecting means for selecting different broadcast station frequencies, detecting means for detecting received signals applied from said tuning circuit, and means for producing audible frequency signals in response to the output of said detecting means; a correction time detector connected to said time counting circuit for detecting when time correction is to occur and for developing an output signal to indicate detection; time correcting means for detecting a time signal from said detecting means and correcting the time displayed by said timepiece circuit in response to the output of said correction time detector; preset memory means for storing contents representative of at least two broadcasting station frequencies and responsive to the operation of said station selecting means; and switching means for changing from one broadcasting station to a specified station capable of producing said time signal in response to the output of said correction time detector.

## 4,315,333
## CIRCUIT ARRANGEMENT FOR A WIDE-BAND VHF-UHF TELEVISION DOUBLE SUPERHETERODYNE RECEIVER

**Sadahiko Yamashita; Hiroshi Onishi; Mitsuo Saito, and Morikazu Sagawa, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan**

**Filed Apr. 23, 1980, Ser. No. 143,809**
**Claims priority, application Japan, Apr. 26, 1979, 54-52089**
**Int. Cl.³ H04B 1/26**
**U.S. Cl. 455—189** **6 Claims**




1. A circuit arrangement for a wide-band VHF-UHF TV channel double superheterodyne receiver, comprising:

(a) a wide-band VHF-UHF amplifier responsive to an incoming carrier frequency of a TV channel signal in the VHF-UHF spectrum;

(b) a first local oscillator;

(c) a first mixer responsive to the output signal of said wide-band amplifier and to the output signal of said first local oscillator for producing a first intermediate frequency which is higher than at least twice the upper limit of said incoming carrier frequency;

(d) filter means including a band-pass filter and a low-pass filter, said filter means being responsive to said first intermediate frequency;

(e) a second local oscillator;

(f) a second mixer responsive to the output signal of said filter means and to the output signal of said second local oscillator for producing a second intermediate frequency;

(g) an intermediate frequency amplifying stage responsive to the output signal of said second mixer for amplifying said second intermediate frequency; and

(h) a plurality of unbalanced transmission lines for effecting the respective connections between said wide-band VHF-UHF amplifier and said first mixer, between said first mixer and said filter means, between said band-pass filter and said low-pass filter, between said filter means and said second mixer, and between said second mixer and said intermediate frequency amplifying stage.

# DESIGN PATENTS

## GRANTED FEB. 9, 1982

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| D34–024 | 262,974 |

# DESIGN PATENTS

GRANTED FEB. 9, 1982

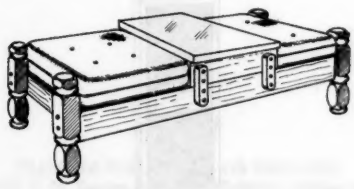
ERRATA

# DESIGNS

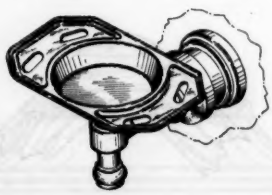
## FEBRUARY 9, 1982

262,920
**LATCH HOOK**
Fred R. Birtcil, 7271 Lassen View Dr., Palo Cedro, Calif. 96073
Filed Dec. 26, 1979, Ser. No. 106,696
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D3—18

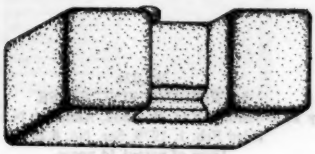
262,921
**COMBINED TABLE AND OTTOMAN**
Benjamin C. Poole, Florence, Ala., assignor to Ajax Industries, Inc., Florence, Ala.
Filed Jun. 28, 1979, Ser. No. 53,055
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—4



262,922
**COMBINED TOOTHBRUSH AND TUMBLER HOLDER**
Gary A. Fleischmann, Sheboygan, Wis., and Lawrence C. Peabody, Rindge, N.H., assignors to Kohler Co., Kohler, Wis.
Filed Apr. 10, 1980, Ser. No. 138,836
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—92

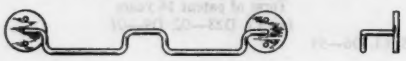


262,923
**REFILL CONTAINER FOR PASTY SUBSTANCE DISPENSER OR SIMILAR ARTICLE**
Bernard Broilliard, Lieudit "Sur Avellard", Sevrier, Haute Savoie, France
Filed Aug. 24, 1978, Ser. No. 936,622
Term of patent 14 years
Int. Cl. D23—*02*; D9—*01*
U.S. Cl. D6—95

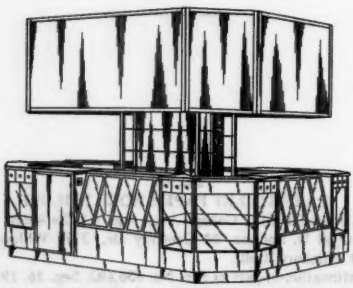


262,924
**SPARE TOILET PAPER ROLL HOLDER**
Else S. Rorbech, 3131 College Ave., Apt. #2, Berkeley, Calif., and Opal D. Samora, 84 Geoffrey Dr., 3777 Willow Pass, West Pittsburg, Calif.
Continuation-in-part of Ser. No. 836,693, Sep. 26, 1977, abandoned. This application Jun. 7, 1979, Ser. No. 46,335
Term of patent 14 years
Int. Cl. D23—*02*; D6—*04*; D3—*02*
U.S. Cl. D6—97

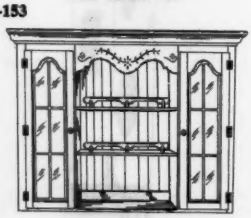
262,925
**STORAGE RACK FOR TWO HOLSTERED HANDGUNS**
Maurice L. Phillips, 3211 Wendover La., Richmond, Va. 23230
Filed Jan. 3, 1979, Ser. No. 725
Term of patent 14 years
Int. Cl. D6—*04;* D8—*06, 08*
U.S. Cl. D6—114



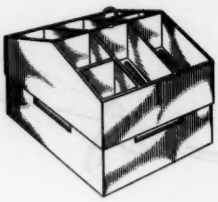
262,926
**MERCHANDISING KIOSK**
Anthony Y. Woolford, P.O. Box 532, Amherst, N.H. 03101
Filed Feb. 1, 1979, Ser. No. 8,252
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—144



262,927
**HUTCH**
Melbourne F. Smith, Jr., Hickory, N.C., assignor to Broyhill Furniture Industries, Inc., Lenoir, N.C.
Filed Oct. 30, 1978, Ser. No. 956,204
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—153



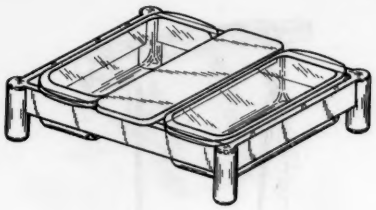
262,928
**COMBINED TRAY AND COMPARTMENT FOR PACKAGED SEASONINGS OR THE LIKE**
Milford L. Medders, Sherman, Tex., assignor to M & M Plastic Manufacturing Company, Balch Springs, Tex.
Filed Mar. 30, 1979, Ser. No. 25,385
Term of patent 14 years
Int. Cl. D6—*04;* D3—*02;* D7—*06;* D99—*00*
U.S. Cl. D6—157



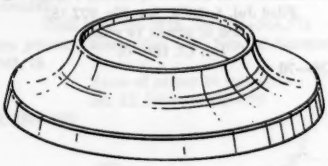
262,929
**FURNITURE DOOR**
Hilco Woudstra, 1123 Forest Hills Dr., High Point, N.C. 27262
Filed Apr. 23, 1979, Ser. No. 32,668
Term of patent 7 years
Int. Cl. D6—*06*
U.S. Cl. D6—193

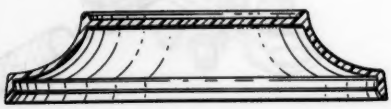
262,930
**FRAME FOR PICTURES AND THE LIKE**
Bernard H. Gurevitz, 2 Tudor City Pl., New York, N.Y. 10017
Filed Feb. 3, 1977, Ser. No. 765,373
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—242

262,931
COMBINED CUTTING BOARD, SERVING DISHES AND SUPPORT STAND
Kenneth R. LeVan, Addison, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Dec. 13, 1978, Ser. No. 969,245
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—3

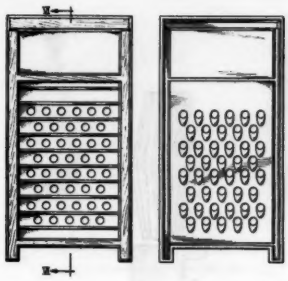


262,932
CLOSURE FOR A BOWL OR THE LIKE
Robert H. C. M. Daenen, Hekelgem, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Jan. 17, 1980, Ser. No. 112,968
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—40

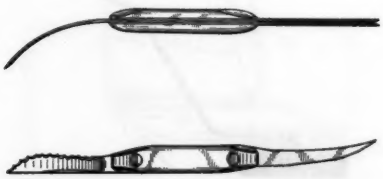




262,933
FOOD GRATER
Roger L. Stoll, Pella, Iowa, assignor to Enduro Corporation, Pella, Iowa
Filed Mar. 19, 1979, Ser. No. 21,619
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—47



262,934
GRAPEFRUIT KNIFE
Clare Gross, Heatherwood Condominiums, 1310 Castlerock, Unit 20, Wenatchee, Wash. 98801
Filed Aug. 31, 1979, Ser. No. 71,556
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—147



262,935
ROTATABLE BEVERAGE MIXER
Gunter A. H. vonElm, 1207 - 79th St., North Bergen, N.J. 07047
Filed Jan. 14, 1980, Ser. No. 111,846
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—157

262,936
MOP
Masanobu Nishiyama; Yosuke Yamamoto, both of Osaka; Toshikazu Murakami, Nishinomiya, and Hisaji Tanaka, Osaka, all of Japan, assignors to Duskin Franchise Kabushiki, Osaka, Japan
Filed Jan. 8, 1980, Ser. No. 110,452
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—40

262,937
SCISSORS
Heinz-Max Huthmann, Harsefeld, Fed. Rep. of Germany, assignor to J. A. Henckels-Zwillingswerk Aktiengesellschaft, Solingen, Fed. Rep. of Germany
Filed May 29, 1979, Ser. No. 42,841
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1978, 250/78
Term of patent 14 years
Int. Cl. D08—*03*
U.S. Cl. D8—57

262,938
DRILLING ALIGNMENT TOOL
Herbert C. Schulze, P.O. Box 6070, Incline Village, Nev. 89450
Filed Jul. 5, 1978, Ser. No. 922,152
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—70

262,939

**SAFETY LOCKING DEVICE FOR GARAGE DOORS**

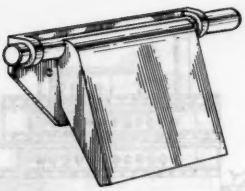
Daniel E. Shook, 2543 Orange St., Costa Mesa, Calif. 92626, and Lawrence R. Klingler, 124 20th St., Huntington Beach, Calif. 92648

Filed Apr. 5, 1976, Ser. No. 673,617

Term of patent 7 years

Int. Cl. D8—*07*

U.S. Cl. D8—336



262,940

**COUPLING NUT**

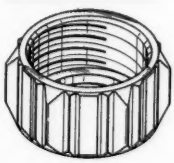
Georg Spinner, Am Eichberg 12, 8152 Feldkirchen-Westerham 1, Fed. Rep. of Germany

Filed Oct. 1, 1979, Ser. No. 80,471

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—397



262,941

**PACKAGING UNIT OF CAPS FOR MARKING PINS**

Kurt Lorber, Schurwaldstr. 114, D-7307 Aichwald 2, Fed. Rep. of Germany

Filed Nov. 29, 1978, Ser. No. 964,773

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1978, 565/78

Term of patent 14 years

Int. Cl. D8—*08*; D9—*99*

U.S. Cl. D8—499

262,942

**COLLAPSIBLE DISPENSING TUBE**

Joseph A. DiPisa, Sr., Lyndhurst, N.J., assignor to Puritan Industries, Auburn, Mass.

Continuation of Ser. No. D. 833,398, Sep. 14, 1977, abandoned. This application Jan. 30, 1980, Ser. No. 116,917

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—302

262,943

**COMBINED SCOOP AND CONTAINER FOR ANIMAL WASTE**

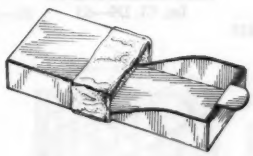
Wendelin Schüdler, Poststrasse 11, 7000 Chur, Switzerland

Filed Feb. 21, 1979, Ser. No. 13,715

Term of patent 14 years

Int. Cl. D9—*03*

U.S. Cl. D9—337



262,944

**PACKAGING CONTAINER FOR FOOD OR THE LIKE**

Nicholas D. Commisso, Victor, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 27, 1977, Ser. No. 810,555

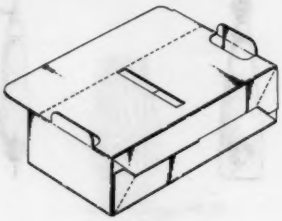
The portion of the term of this patent subsequent to Feb. 9, 1996, has been disclaimed.

Term of patent 14 years

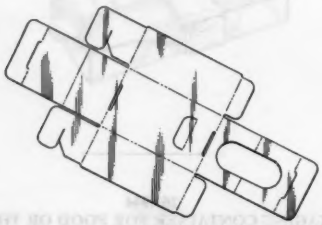
Int. Cl. D9—*03*

U.S. Cl. D9—347

262,945
CONTAINER FOR EJECTED USED STENCILS
Eric K. Lytra, Luton, England, assignor to Gestetner Limited, London, England
Filed Jan. 31, 1979, Ser. No. 8,192
Claims priority, application United Kingdom, Aug. 11, 1978, 985879/78
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—415

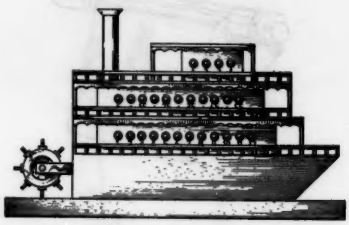


262,946
BLANK FOR A PACKAGING TRAY
Janet L. Mills, Los Angeles, and Conrad D. Wiedmann, Inglewood, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Mar. 5, 1979, Ser. No. 17,222
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—433



262,947
CLOCK
Stephen Barsanti, 3217 Dorcich St., San Jose, Calif. 95117
Filed Dec. 3, 1979, Ser. No. 99,647
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—6

262,948
BOAT CLOCK
Patricia D. Mayenschein, P.O. Box 67, and Joseph M. Mayenschein, Box 85, both of Sextonville, Wis. 53584
Filed Feb. 11, 1980, Ser. No. 120,508
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



262,949
BRACELET WATCH
Alain D. Perrin, Rueil-Malmaison, France, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Division of Ser. No. 968,169, Dec. 11, 1978. This application Feb. 28, 1979, Ser. No. 15,761
Claims priority, application France, Jun. 12, 1978, 76645
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—32

262,950

COORDINATE MEASUREMENT MACHINE FOR USE IN MEASURING SIZES, SHAPES, DIMENSIONS AND THE LIKE

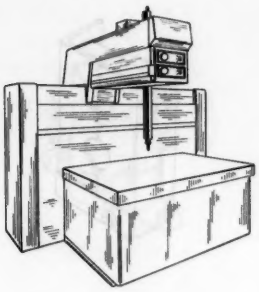
Russell E. Orr, II, El Toro, Calif., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 26, 1979, Ser. No. 23,877

Term of patent 14 years

Int. Cl. D10—*04*

U.S. Cl. D10—46



262,951

DARTS SCORING MACHINE

William J. Martin, Jr., London, England, assignor to Nodor Scores Limited, London, England

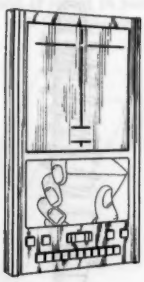
Filed Aug. 23, 1979, Ser. No. 69,337

Claims priority, application United Kingdom, Mar. 5, 1979, 9[illegible]20

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D10—46.1



262,952

HOUSING FOR A FIRE AND SMOKE DETECTOR

Harvey Hanig, North Aurora, Ill., assignor to Pittway Corporation, Northbrook, Ill.

Filed Jan. 8, 1979, Ser. No. 1,769

Term of patent 7 years

Int. Cl. D10—*05*

U.S. Cl. D10—106

262,953

FINGER RING OR SIMILAR ARTICLE

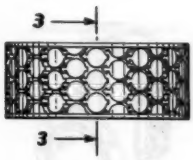
Max Bogner, and Larry Grun, both of 2 W. 47th St., New York, N.Y. 10036

Filed Feb. 12, 1980, Ser. No. 120,736

Term of patent 14 years

Int. Cl. D11—*01*

U.S. Cl. D11—38



262,954

ASTROLOGY CHART DISPLAY

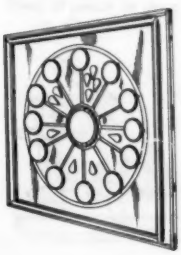
Edward H. Shores, 6260 Melody La., Dallas, Tex. 75231

Filed Apr. 9, 1979, Ser. No. 28,126

Term of patent 14 years

Int. Cl. D11—*02*

U.S. Cl. D11—132

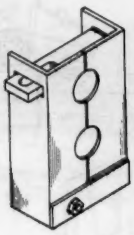


262,955
VEHICLE
John T. Strickland, Jr., Ormond Beach, Fla., assignor to Skate Car, Inc., Ormond Beach, Fla.
Filed Oct. 16, 1978, Ser. No. 951,847
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—83

262,956
GAS TANK EXTENSION
Robert B. McNab, Rte. 12, Dawn Dr., and James A. Wolfe, Rte. 10, Box 199, both of Jonesboro, Tenn. 37659
Filed Aug. 27, 1979, Ser. No. 69,632
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155

262,957
MOTORCYCLE ENCLOSURE
Royal J. Harmer, 2515 Arlington Ave., Torrance, Calif. 90501
Filed Oct. 30, 1978, Ser. No. 956,069
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—156

262,958
STORAGE RACK FOR ATTACHMENT TO THE CAB OF A SEMI-TRAILER FOR HOLDING A PAIR OF SAFETY STRUTS
Arlie G. Parrish, 603 N. Meridian, Valley Center, Kans. 67147
Filed May 10, 1979, Ser. No. 37,678
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157



262,959
SHOCK ABSORBER
Arnold A. Cowan, Encino, Calif., assignor to Interpart Corporation, Gardena, Calif.
Filed Aug. 13, 1979, Ser. No. 65,888
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—159

262,960

**FLANGED-COLLAR HEAT SINK FOR ELECTRONIC DEVICES**

Philip A. Johnson, Kingston, and Alfred F. McCarthy, Belmount, both of N.H., assignors to Aavid Engineering, Inc., Laconia, N.H.

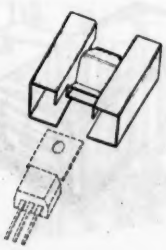
Filed Apr. 24, 1979, Ser. No. 32,923
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23

262,961

**CLIP-ON HEAT SINK FOR ELECTRONIC DEVICES**

Alfred F. McCarthy, Belmount, N.H., assignor to Aavid Engineering, Inc., Laconia, N.H.

Filed Sep. 17, 1979, Ser. No. 75,958
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—23

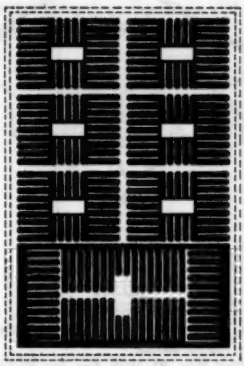


262,962

**SILICON WAFER EMITTER ELECTRODE CONFIGURATION**

Winton C. Strumpell, 6027 Corning Ave., Los Angeles, Calif. 90056

Filed Nov. 3, 1978, Ser. No. 957,770
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—99

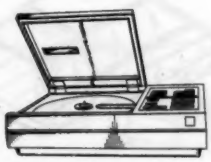


262,963

**VIDEO DISC PLAYER**

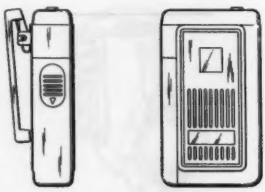
Takayuki Hiraki, Tokyo, Japan, assignor to Pioneer Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 11, 1980, Ser. No. 111,395
Claims priority, application Japan, Jul. 11, 1979, 54-28861
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—1

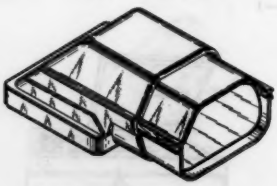


262,964
HOUSING FOR AN AUTOMATIC TELEPHONE ALARM SYSTEM
Richard W. Anderson, Reading, and Alfred I. Bottner, Natick, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.
Filed Mar. 30, 1979, Ser. No. 25,298
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—59

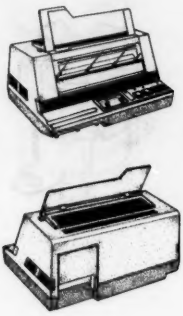
262,965
RADIO RECEIVER
Keisuke Iwata, Mansei- Bldg., 1-16, 1-Chome, Soto-Kanda, Chiyoda-Ku, Tokyo, Japan
Filed Nov. 20, 1979, Ser. No. 96,010
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70



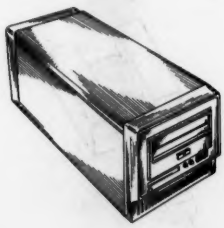
262,966
PROJECTION ADAPTER FOR A CONVENTIONAL TELEVISION RECEIVER
Conrad R. Schudel, 6973 Consolidated Way, San Diego, Calif. 92121
Filed Aug. 17, 1979, Ser. No. 67,400
Term of patent 7 years
Int. Cl. D14—*03*
U.S. Cl. D14—84



262,967
FACSIMILE TRANSCEIVER
Yoshiyuki Fujiyama, Ueda, and Kunihiko Asakura, Nagano, both of Japan, assignors to Matsushita Graphic Communication Systems, Inc., Tokyo, Japan
Filed Oct. 9, 1979, Ser. No. 82,996
Claims priority, application Japan, Apr. 16, 1979, 54-15493
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—94



262,968
MEDIA CONVERTER UNIT FOR A FLOPPY DISC FOR DATA PROCESSING DISPLAY SYSTEM
Claude H. Hutcheson, Garland, Tex., assignor to Xerox Corporation, Stamford, Conn.
Filed Oct. 15, 1979, Ser. No. 85,179
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—107



262,969

FUEL INJECTION NOZZLE

Peter Howes, Gerrards Cross, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Oct. 29, 1979, Ser. No. 88,925

Claims priority, application United Kingdom, Aug. 16, 1979, 7901239/79

Term of patent 14 years

Int. Cl. D15—*01*

U.S. Cl. D15—5

262,970

QUADRUPLE GASOLINE PUMP

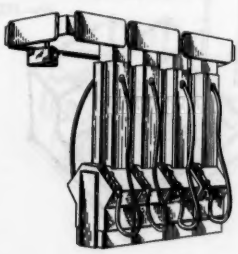
David C. Rowan, and Armin E. Mittermaier, both of Fort Wayne, Ind., assignors to Tokheim Corporation, Fort Wayne, Ind.

Filed May 29, 1979, Ser. No. 43,437

Term of patent 14 years

Int. Cl. D15—*02*

U.S. Cl. D15—9.2



262,971

GASOLINE DISPENSER

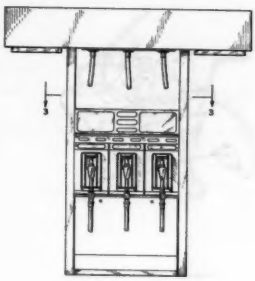
George D. Robinson, Jr.; Angelo M. Lacivita; Robert T. Day, Jr., all of Greensboro, N.C., and Charles C. Keane, Weymouth, Mass., assignors to Gilbert & Barker Manufacturing Co., Inc., Greensboro, N.C.

Filed Jun. 6, 1980, Ser. No. 157,084

Term of patent 14 years

Int. Cl. D15—*02*

U.S. Cl. D15—9.2



262,972

INSERT FOR AGRICULTURAL APPLICATOR KNIFE

Norvel J. Ronck, Wakita, and Halsey J. Wetmore, II, Guymon, both of Okla., assignors to Adams Hard-Facing Company, Inc., Guymon, Okla.

Filed Jun. 11, 1979, Ser. No. 47,278

Term of patent 14 years

Int. Cl. D15—*03*

U.S. Cl. D15—11

262,973

MINING VEHICLE

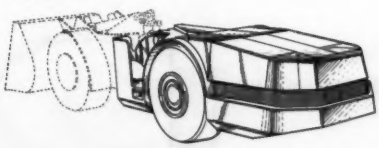
John Griffin, and T. Daryl Hatch, both of Salt Lake City, Utah, assignors to Envirotech Corporation, San Mateo, Calif.

Filed Sep. 1, 1978, Ser. No. 938,860

Term of patent 14 years

Int. Cl. D15—*04*

U.S. Cl. D15—21

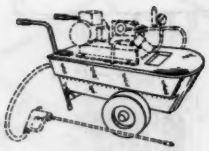


262,974

**CART FOR A PORTABLE POWER WASHING UNIT OR SIMILAR ARTICLE**

C. John Campbell, and Linsley E. Baldwin, both of Iowa Falls, Iowa, assignors to Campbell Supply Co., Iowa Falls, Iowa

Filed Nov. 29, 1979, Ser. No. 98,497
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D34—24



262,975

**COFFEE GRINDER**

Juan A. G. Garriga, Barcelona, Spain, assignor to Braun Espanola, S.A., Spain

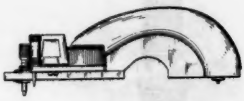
Filed Jun. 21, 1979, Ser. No. 50,610
Claims priority, application Spain, Dec. 29, 1978, 93.654
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D15—100

262,976

**LETTERING SCRIBER**

Harald Koelichen, Jr., Geretsried, Fed. Rep. of Germany, assignor to Standardgraph Filler & Fiebig GmbH, Fed. Rep. of Germany

Filed Apr. 24, 1979, Ser. No. 33,029
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1978, 113943
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—41

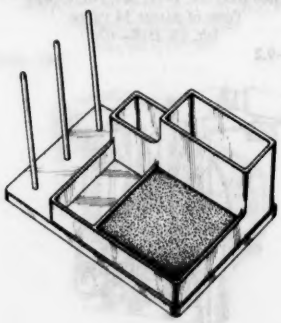


262,977

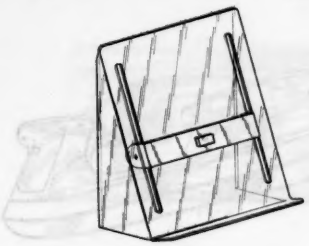
**MATERIALS AND TOOLS ORGANIZER FOR ARTS AND CRAFTS**

Ethel A. Ferris, 712 Reid St., De Pere, Wis. 54115

Filed Jun. 14, 1979, Ser. No. 48,513
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—75



262,978
TYPING COPY HOLDER
Bruce K. Nagley, 4765 Kingshill Dr., Apt. A, Columbus, Ohio 43229
Filed Feb. 21, 1980, Ser. No. 123,127
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—91



262,979
MUSICAL FIGURE TOY
Shigeru Saitoh, 6-4, 2-Chome, Kuramae, Taito-Ku, Tokyo, Japan
Filed Dec. 6, 1979, Ser. No. 101,744
Claims priority, application Japan, Sep. 29, 1979, 54-40917
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—64

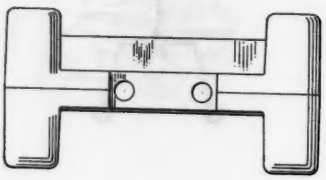
262,980
MUSICAL FIGURE TOY
Shigeru Saitoh, 6-4, 2-Chome, Kuramae, Taito-Ku, Tokyo, Japan
Filed Dec. 6, 1979, Ser. No. 101,745
Claims priority, application Japan, Oct. 17, 1979, 54-43374
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—64

262,981
KINETIC SCULPTURE
Hidetoshi Matsui, 6, Imazunaka 3-chome, Tsurumi-ku, Osaka 538, Japan
Filed Jun. 25, 1979, Ser. No. 51,692
Claims priority, application Japan, Apr. 6, 1979, 54-14091
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D21—102

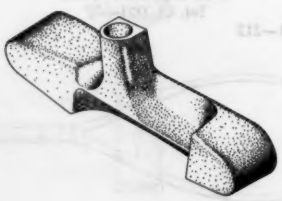
262,982
TOY PENDANT
Yoichi Abe, Tokyo, and Hajime Matsumoto, Chiba, both of Japan, assignors to Toybox Corporation, Tokyo, Japan
Filed Apr. 13, 1979, Ser. No. 29,833
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—177

262,983
TENNIS RACKET FRAME
John G. Howe, Boulder, Colo., assignor to AMF Incorporated, White Plains, N.Y.
Filed Jul. 25, 1979, Ser. No. 60,301
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—212

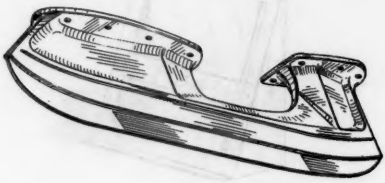
262,984
GOLF CLUB HEAD
Philippe M. Jeghers, Esneux, Belgium, assignor to FN International, Luxembourg, Luxembourg
Filed Jan. 8, 1979, Ser. No. 1,844
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—217

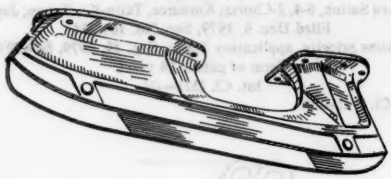


262,985
GOLF PUTTER HEAD
Charles A. Sanna, 909 Farwell Dr., Madison, Wis. 53704
Filed Jul. 25, 1979, Ser. No. 60,806
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—217



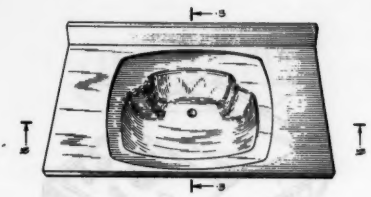
262,986
ICE SKATE
Malcolm F. Cox, Jr., Brampton, Canada, assignor to Canada Cycle and Motor Company Limited, Weston, Canada
Filed Jul. 19, 1979, Ser. No. 58,660
Claims priority, application Canada, Jan. 23, 1979, 23-01-79-2
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—225



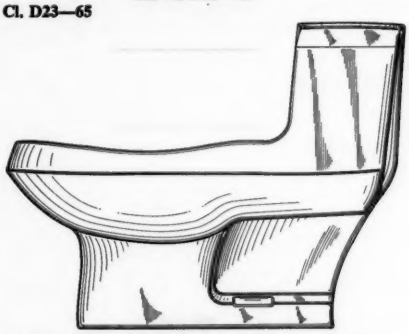


262,987
MAGNETIC WATER CONDITIONER
Roland K. Carpenter, Roseville, Minn., assignor to Aqua Magnetics, Inc., Bloomington, Minn.
Filed Feb. 4, 1980, Ser. No. 118,448
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

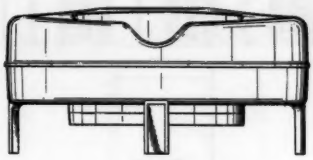
262,988
LAVATORY
William L. Lippert, Jr., Colgate, and Wayne M. Lippert, Wauwatosa, both of Wis., assignors to Lippert Corporation, Menomonee Falls, Wis.
Filed Apr. 8, 1980, Ser. No. 138,377
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58

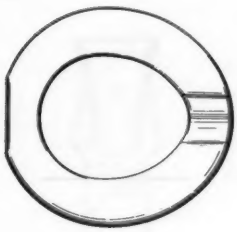


262,989
TOILET OR SIMILAR ARTICLE
Henry M. Stairs, Jr., Neshanic, N.J., assignor to American Standard Inc., New York, N.Y.
Filed Jul. 31, 1979, Ser. No. 62,860
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—65

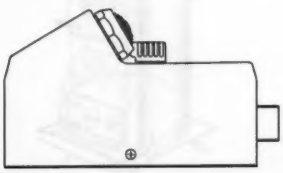


262,990
ELEVATED TOILET SEAT
Michael D. R. Rodger, Kegworth, England, assignor to Gordon Ellis & Co., England
Filed Jan. 28, 1980, Ser. No. 116,232
Claims priority, application United Kingdom, Jul. 31, 1979, 991002/79
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—11



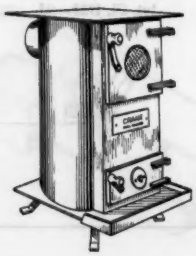


262,991
WATER HEATER
William G. S. Owen, St. Martin, Wales, assignor to IMI Santon Limited, Newport, Wales
Filed Aug. 30, 1979, Ser. No. 71,104
Claims priority, application United Kingdom, Apr. 24, 1979, 989636/79
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—86



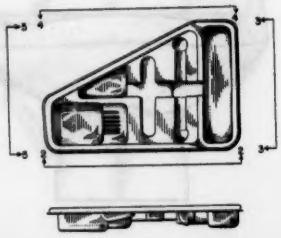
262,992
WATER HEATER
William G. S. Owen, St. Martin, Wales, assignor to IMI Santon Limited, Newport, Wales
Filed Aug. 30, 1979, Ser. No. 71,105
Claims priority, application United Kingdom, Apr. 24, 1979, 989635/79
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—86

262,993
COAL STOVE
Douglas L. Crane, P.O. Box 2016, Duxbury, Mass. 02332
Filed Feb. 11, 1980, Ser. No. 120,388
Term of patent 7 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

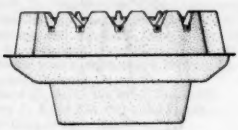


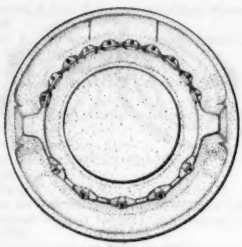
262,994
PENILE TUMESCENCE MONITOR
Frederick W. Holler, Jr., and Donald R. Wiedeman, both of Cherry Hill, N.J., assignors to Event Systems, Inc., Moorestown, N.J.
Filed Oct. 13, 1978, Ser. No. 951,279
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—8

262,995
URINARY CATHERIZATION PREPARATION TRAY
Rodolfo Gaba, Chino; David C. Garland, Claremont, and James L. Pacek, Laguna Hills, all of Calif., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Dec. 7, 1978, Ser. No. 967,464
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—31

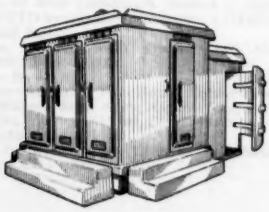


262,996
SURGICAL SPONGE COUNT RECEPTACLE OR SIMILAR ARTICLE
Carl H. Rickmeir, Sheboygan Falls, Wis., assignor to Bemis Manufacturing Company, Sheboygan Falls, Wis.
Filed May 29, 1980, Ser. No. 154,561
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—56

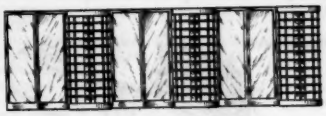




262,997
PORTABLE MULTIPLE-TOILET BUILDING
William A. Reynolds, 328 Walnut La., Youngstown, N.Y. 14174
Filed Dec. 3, 1979, Ser. No. 99,314
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—1



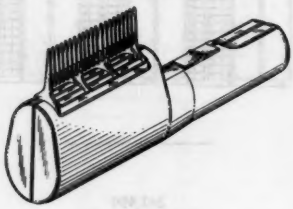
262,998
INTERIOR WALL FOR A STORE
Stanley H. Rosenthal, Rte. 2, Box 713, Air Harbor Rd., Greensboro, N.C. 27405
Filed Feb. 12, 1979, Ser. No. 11,222
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—58



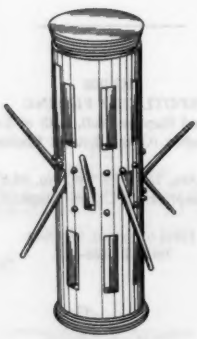
262,999
CANDLE LAMP
Joseph Spencer, 2950 Glen Oak, Lot 251, Clearwater, Fla. 33519
Filed Apr. 20, 1979, Ser. No. 31,771
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D26—11

263,000
SPOTLIGHT FITTING
Robert Heritage, and Stephen Hall, both of London, England, assignors to Rotaflex (Great Britain) Limited, London, England
Filed Jun. 14, 1979, Ser. No. 48,676
Claims priority, application United Kingdom, Jan. 25, 1979, 988247/79
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—63

263,001
DRYER AND COMBINED COMB ATTACHMENT
John Wistrand, New Canaan, Conn., assignor to Clairol Incorporated, New York, N.Y.
Division of Ser. No. 789,379, Apr. 21, 1977, Pat. No. D. 252,472.
This application Feb. 12, 1979, Ser. No. 11,464
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13



263,002
CURLER
Harry Sundin, Karlshamn, Sweden, assignor to AB Karlshamns Plastindustri, Karlshamn, Sweden
Filed Oct. 12, 1978, Ser. No. 950,869
Claims priority, application Sweden, Apr. 20, 1978, 781103
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—37



263,003
VANITY MIRROR
King C. Tong, Kowloon, Hong Kong, assignor to Kwok K. Cheung; King S. Tong and Wing K. Tong, all of Kwai Chung, Hong Kong
Filed Feb. 11, 1980, Ser. No. 120,645
Claims priority, application United Kingdom, Jan. 2, 1980, 993022/80
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—78

263,004
COMPACT CASE
Daniel Gross, 251 W. 20th St., New York, N.Y. 10001
Filed Jun. 4, 1980, Ser. No. 156,297
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—83

# LIST OF PATENTEES

## TO WHOM

## PATENTS WERE ISSUED ON THE 9TH DAY OF FEBRUARY, 1982

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

**A. Sarna & Son Limited:** *See—*
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**Abe, Haruhiko; Mashiko, Yoji; Harada, Hiroshi; Asai, Sotoju; Mizuguchi, Kazuo; and Nomoto, Sumio, to Mitsubishi Denki Kabushiki Kaisha.** Method for forming a fine pattern of an aluminum film. 4,314,874, Cl. 156-628.000.

**Abelson, Mark B., to Cooper Laboratories, Inc.** Compositions and method for treating red eye. 4,315,024, Cl. 424-273.00R.

**Abraham, Fayez F., to Tyler Refrigeration Corporation.** One and a half band refrigerated display case. 4,314,453, Cl. 62-82.000.

**Acampora, Anthony; and Reudink, Douglas O., to Bell Telephone Laboratories, Incorporated.** Satellite communication system with a plurality of limited scan spot beams. 4,315,262, Cl. 343-100.0ST.

**ACF Industries, Inc.:** *See—*
Doerr, Richard D., 4,315,174, Cl. 310-68.00B.
Tipton, Larry J., 4,314,536, Cl. 123-440.000.

**Acme-Cleveland Corporation:** *See—*
Rauckhorst, James E.; and Skingle, Thomas J., 4,314,616, Cl. 175-394.000.

**Adam, Peter:** *See—*
Brauer, Gerhard; Adam, Peter; and Seuffert, Werner, 4,314,692, Cl. 254-362.000.

**Adams, Frederick J., to Cam Gears Limited.** Speed control systems. 4,314,485, Cl. 74-200.000.

**Adidas Fabrique De Chaussures De Sport:** *See—*
Kreyenbuhl, Armand, 4,314,713, Cl. 280-615.000.

**Adolphi, Heinrich:** *See—*
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**Advanced Micro Devices, Inc.:** *See—*
Apfel, Russell J., 4,315,207, Cl. 323-284.000.

**AECI Limited:** *See—*
Seligmann, Peter C., 4,314,507, Cl. 102-217.000.

**Agence Nationale de Valorisation de la Recherche (ANVAR):** *See—*
Ducol, Jean-Paul; Mesny, Jacques; and Warret, Julien, 4,314,462, Cl. 66-152.000.

**Agency of Industrial Science & Technology Ministry of International Trade & Industry:** *See—*
Kataoka, Shoei, 4,315,214, Cl. 324-208.000.
Tanie, Kazuo; and Tachi, Susumu, 4,314,379, Cl. 3-1.100.

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**Agfa-Gevaert Aktiengesellschaft:** *See—*
Ranz, Erwin; Lohmann, Joachim W.; and Schutz, Heinz-Dieter, 4,315,070, Cl. 430-505.000.
Webersik, Heinz, 4,314,759, Cl. 355-75.000.

**Agusto, Robert G.:** *See—*
Basa, Kenneth B.; and Agusto, Robert G., 4,315,035, Cl. 426-250.000.

**Ahlen, Karl G., to S.R.M. Hydromekanik Aktiebolag.** Braking method for vehicle transmission. 4,314,487, Cl. 74-865.000.

**Aihara, Sukeji:** *See—*
Mori, Fumio; Omura, Yoshiaki; Fujita, Yoshiji; Nishida, Takashi; Hosogai, Takeo; Wada, Fumio; Aihara, Sukeji; Tamai, Yoshin; and Itoi, Kazuo, 4,315,029, Cl. 424-304.000.

**Ainsworth, Neil L.:** *See—*
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**Airco, Inc.:** *See—*
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**Airelec Industries:** *See—*
Henault, Jean-Paul, 4,315,142, Cl. 219-511.000.

**Aisan Industry Co., Ltd.:** *See—*
Takeuchi, Yuzu; Takada, Shigetaka; and Morino, Toshiharu, 4,314,535, Cl. 123-439.000.

**Aisin Seiki Kabushiki Kaisha:** *See—*
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**Aitken, Alan, to Mitel Corporation.** Method of making integrated CMOS and CTD by selective implantation. 4,314,857, Cl. 148-1.500.

**Akelah, Ahmed:** *See—*
Naarmann, Herbert; Wulff, Guenter; and Akelah, Ahmed, 4,315,089, Cl. 526-89.000.

**Akita, Yoshio:** *See—*
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**Akiyama, Taichiro:** *See—*
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**Aktiebolaget Electrolux:** *See—*
Harre, Kurt J. S., 4,314,770, Cl. 400-175.000.

**Akzona Incorporated:** *See—*
Heinen, Peter; and Gossens, Peter, 4,314,391, Cl. 28-273.000.

**Albarda, Scato, to Dragerwerk Aktiengesellschaft.** Method and apparatus for determining alcohol concentration in the blood. 4,314,564, Cl. 128-719.000.

**Alefeld, Georg.** Thermodynamic process for exploiting high-temperature thermal energy. 4,314,448, Cl. 60-673.000.

**Alfa-Laval AB:** *See—*
Nordenskjold, Kjell, 4,314,526, Cl. 119-14.550.

**Alfred Schmidt GmbH:** *See—*
Schmidt, Alfred, 4,314,435, Cl. 56-13.300.

**Alfred Wertli Inc.:** *See—*
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**Alkire, Gerald R.:** *See—*
Calfo, Raymond M.; Alkire, Gerald R.; Dailey, George F.; and Mulach, Arthur, 4,315,173, Cl. 310-53.000.

**Allen Engineering Corporation:** *See—*
Allen, J. Dewayne, 4,314,773, Cl. 404-116.000.

**Allen, J. Dewayne, to Allen Engineering Corporation.** High density concrete placer. 4,314,773, Cl. 404-116.000.

**Allen, Louis B., Jr.; Koenig, Herbert G., Jr.; and Meyer, Danny D., to McDonnell Douglas Corporation.** Heat sink laser diode array. 4,315,225, Cl. 372-35.000.

**Allen, Richard E., to Corning Glass Works.** Nonstick conductive coating. 4,314,559, Cl. 128-303.140.

**Allied Corporation:** *See—*
DeCristofaro, Nicholas J.; and Sexton, Peter, 4,314,661, Cl. 228-263.00R.

**Allison, George M., III, to Phillips Petroleum Company.** Hot melt adhesive and additive therefore. 4,314,926, Cl. 260-33.6AQ.

**Alpha Arms, Inc.:** *See—*
Koon, Homer E., Jr., 4,314,419, Cl. 42-50.000.

**Alway, Peter:** *See—*
Bud, Hans; and Alway, Peter, 4,315,144, Cl. 235-92.00C.

**ALZA Corporation:** *See—*
Chandrasekaran, Santosh K., 4,314,557, Cl. 128-260.000.

**Amberg, Ralph G.:** *See—*
Amberg, Stephen W.; and Amberg, Ralph G., 4,314,799, Cl. 425-296.000.

**Amberg, Stephen W.; and Amberg, Ralph G., to Owens-Illinois, Inc.** Compression molding machine for organic thermoplastic materials. 4,314,799, Cl. 425-296.000.

**American Cyanamid Company:** *See—*
Kaplan, Donald S., 4,314,561, Cl. 128-335.500.

**American Microsystems, Inc.:** *See—*
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**American Standard Inc.:** *See—*
McElroy, John M.; and Darrow, John O. G., 4,315,208, Cl. 323-303.000.

**Amitani, Joji; Ito, Takashi; and Hirayama, Kazuhiro, to Canon Kabushiki Kaisha.** Cleaning device. 4,314,756, Cl. 355-15.000.

**Ampex Corporation:** *See—*
Lemoine, Maurice G.; and Pasdera, Leonard A., 4,315,331, Cl. 371-31.000.
Pasdera, Leonard A., 4,315,278, Cl. 358-16.000.

**Amstar Corporation:** *See—*
Bonney, Oren V., 4,314,985, Cl. 423-636.000.

**Anchor/Darling Industries, Inc.:** *See—*
Sulzer, Harry E., 4,314,473, Cl. 73-11.000.

**Anderson, Blair V.; Feldman, Morris; and Jacoby, Richard.** Orthopedic shoe. 4,314,412, Cl. 36-100.000.

**Anderson, Carl C.:** *See—*
Birkmeyer, William J.; Lewarchik, Ronald J.; Klanica, Joseph A.; and Anderson, Carl C., 4,314,918, Cl. 260-20.000.

**Anderson, Don L., Jr.:** *See—*
Beck, Boyd R.; Stewart, Lamar H.; Tapp, Steven; Anderson, Don L., Jr.; and Nuffer, Daniel E., 4,314,890, Cl. 203-1.000.

**Anderson, Richard D.; Fauchier, Jess F., II; and Laciak, Francis M., to Pako Corporation.** Photographic printer with automatic paper splice detector. 4,314,757, Cl. 355-29.000.

**Angelini, Gianfranco:** *See—*
Leoni, Roberto; Baldini, Alberto; Calloni, Angelo; and Angelini, Gianfranco, 4,314,959, Cl. 264-187.000.

**Anorga, Carlos J., to Upjohn Company, The.** The Flame retardant flexible polyurethane foam containing finely divided inorganic salt wherein a mold of said salt contains at least five moles of water. 4,315,078, Cl. 521-103.000.

**Aoki, Harumi:** *See—*
Haraguchi, Keisuke; and Aoki, Harumi, 4,314,747, Cl. 354-25.000.

Apfel, Russell J., to Advanced Micro Devices, Inc. Current controlled battery feed circuit. 4,315,207, Cl. 323-284.000.

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Waters, Michael A., 4,314,452, Cl. 62-77.000.

Apstein, Carl S., to Boston University, The Trustees of. Method of treating an arrested heart. 4,314,550, Cl. 128-1.00D.

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Bert, Alain; Leclerc, Bernard; and Archambault, Yves, 4,315,275, Cl. 357-56.000.

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Arimura, Hirofumi: *See*—
Uemura, Yahiro; Arimura, Hirofumi; Morise, Hiroshi; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,314,935, Cl. 260-112.00R.

Armco Inc.: *See*—
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Armstrong, Donald E.; Sindlinger, Ronald E.; and Harvey, William J., to GTE Products Corporation. Photoflash lamp construction and method of making same. 4,314,394, Cl. 29-25.160.

Armstrong, Rolfe D.; and Walsh, Dennis A., to NCR Corporation. Diagnostic circuitry in a data processor. 4,315,313, Cl. 364-200.000.

Arndt, Friedrich: *See*—
Kruger, Hans-Rudolf; Arndt, Friedrich; Baumert, Dietrich; and Rusch, Reinhart, 4,314,839, Cl. 71-73.000.

Arthur, Robert M.; and Triatik, Jerome J., to Arthur Technology, Inc. Submersible respirometer. 4,314,969, Cl. 422-68.000.

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Arthur, Robert M.; and Triatik, Jerome J., 4,314,969, Cl. 422-68.000.

Artweger, Wolfgang; and Reitz, Otfried, to "Wohn-Art" Freizeitartikel Gesellschaft m.b.H. Cabin structure displaceably mountable on a vehicle. 4,314,726, Cl. 296-164.000.

Arvan, John. Key ring with positive locking member. 4,314,467, Cl. 70-456.00R.

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Haraguchi, Keisuke; and Aoki, Harumi, 4,314,747, Cl. 354-25.000.
Komoto, Shinsuke, 4,314,749, Cl. 354-139.000.

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Mori, Kazumasa; Asahi, Taro; Banzai, Keiichiro; Iwaki, Katsutaro; Muto, Katsuya; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,315,205, Cl. 322-99.000.

Asai, Sotoju: *See*—
Abe, Haruhiko; Mashiko, Yoji; Harada, Hiroshi; Asai, Sotoju; Mizuguchi, Kazuo; and Nomoto, Sumio, 4,314,874, Cl. 156-628.000.

Asano, Masaharu; Tamura, Hideyuki; and Furuhashi, Shoji, to Nissan Motor Co., Ltd. Fuel feedback control system for internal combustion engine. 4,314,537, Cl. 123-440.000.

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Atalla, Martin M., to Atalla Technovations. Method and apparatus for securing data transmissions. 4,315,101, Cl. 178-22.080.

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Styring, Ralph E., Jr., 4,314,899, Cl. 208-11.00R.

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Barbini, Richard J.: *See*—
Leeds, Richard L.; Montross, Jeffrey A.; and Barbini, Richard J., 4,314,451, Cl. 62-68.000.

Baril, Jacques; and Gaborieau, Jean-Yves, to Societe de Vente de l' Aluminium Pechiney. Stamping in liquid female tool. 4,314,468, Cl. 72-57.000.

Barna, Stephen L. Hand held tongs. 4,314,724, Cl. 294-99.00R.

Barnes, Gary D. Combination transfer depth gauge. 4,314,406, Cl. 33-169.00B.

Barnes, Gary T., to University of Alabama in Birmingham, The. Multiple beam computed tomography (CT) scanner. 4,315,157, Cl. 250-445.00T.

Barnes, Roderick G. L. Luminicent materials. 4,314,910, Cl. 252-301.40R.

Barnett, Burton; Kinaler, Martin R.; and Nelson, Lyle A., to Rockwell International Corporation. Deployable shield. 4,314,682, Cl. 244-158.00R.

Barre, Francoise: *See*—
Gazard, Maryse; Eranian, Armand; Barre, Francoise; and Duchesne, Claude, 4,315,067, Cl. 430-296.000.

Bartley, Harold D.: *See*—
Gaiser, William R.; Crutchfield, E. Bryant; and Bartley, Harold D., 4,314,651, Cl. 220-326.000.

Bartolini, Robert A.: *See*—
Bloom, Allen; Seffren, Sidney S.; Bell, Alan E.; and Bartolini, Robert A., 4,315,269, Cl. 346-135.100.

Basa, Kenneth B.; and Agusto, Robert G., to National Can Corporation. Colorants for lipid-based confection compositions and lipid-based compositions made therefrom. 4,315,035, Cl. 426-250.000.

Basa, Kenneth B.: *See*—
Levinson, Arthur A.; and Basa, Kenneth B., 4,315,034, Cl. 426-104.000.

BASF Aktiengesellschaft: *See*—
Hohenschutz, Heinz; Gnad, Josef; Dinkhauser, Guenter; and Schaefer, Eberhard, 4,314,947, Cl. 260-410.000.
Koenig, Karl-Heinz; Feuerherd, Karl-Heinz; and Oeser, Heinz-Guenter, 4,314,948, Cl. 260-453.00P.
Lehner, August; Kud, Alexander; and Hartmann, Heinrich, 4,314,922, Cl. 260-29.2TN.
Linhart, Friedrich; Zeeh, Bernd; and Adolphi, Heinrich, 4,315,017, Cl. 424-269.000.
Maurer, Robert, 4,315,002, Cl. 424-181.000.
Naarmann, Herbert; Wulff, Guenter; and Akelah, Ahmed, 4,315,089, Cl. 526-89.000.
Petersen, Harro; Pai, Panemangalore S.; and Reichert, Manfred, 4,314,806, Cl. 8-187.000.
Theysohn, Rainer; and Reimann, Horst, 4,314,927, Cl. 260-37.00N.

BASF Farben & Fasern AG: *See*—
Poth, Ulrich; Moller, Dieter; and Dobbelstein, Arnold, 4,315,053, Cl. 428-423.700.

Basovsky, Boris I.: *See*—
Karpov, Evgeny F.; Birenberg, Isaak E.; Basovsky, Boris I.; and Popov, Vladimir V., 4,314,475, Cl. 73-27.00R.

Bassetti, Aldo: *See*—
Goglio, Luigi; and Bassetti, Aldo, 4,314,768, Cl. 366-156.000.

Bates, Albert M.: *See*—
Junod, Michael T.; and Bates, Albert M., 4,315,324, Cl. 367-3.000.

Battelle Development Corporation: *See*—
Thomas, David L.; and Hackman, Donald J., 4,314,612, Cl. 173-119.000.

Battelle Memorial Institute: *See*—
Harmer, Alan L., 4,315,147, Cl. 250-227.000.
Putnam, Abbott A.; and Locklin, David W., 4,314,444, Cl. 60-39.770.

Baum, Lennart: *See*—
Weigl, Walter; Bergman, Ulf; Baum, Lennart; and Schnitger, Herbert, 4,315,154, Cl. 250-402.000.

Baumert, Dietrich: *See*—
Kruger, Hans-Rudolf; Arndt, Friedrich; Baumert, Dietrich; and Rusch, Reinhart, 4,314,839, Cl. 71-73.000.

Baxter Travenol Laboratories, Inc.: *See*—
Becker, Lawrence F., 4,314,480, Cl. 73-706.000.
Loving, James A., 4,314,568, Cl. 128-327.000.

Bayer Aktiengesellschaft: *See*—
Bier, Peter; and Binsack, Rudolf, 4,314,928, Cl. 260-40.00R.
Boden, Heinrich; and Schneider, Walter, 4,314,955, Cl. 264-51.000.
Boden, Heinrich; Rentz, Bernhard; Niggemann, Johann; and Just, Gerhard, 4,314,963, Cl. 264-328.600.
Bonse, Gerhard; Blank, Heinz U.; and Kratzer, Hans, 4,315,094, Cl. 544-182.000.
Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, 4,315,008, Cl. 424-200.000.
Pfister, Theodor; Schenk, Wolfgang; and Blank, Heinz U., 4,314,950, Cl. 260-543.00R.
Steinberger, Helmut; Schonfelder, Manfred; Moretto, Hans-Heinrich; and Wegner, Christian, 4,315,091, Cl. 528-28.000.

Bayer, Raymond M.; and Rodgers, Robert E., to Leach Industries. Game racquet. 4,314,599, Cl. 273-73.00D.

Bayliss, John A.; Cox, George W.; Forbes, Bert E.; and Kahn, Kevin C., to Intel Corporation. Input/output data processing system. 4,315,310, Cl. 364-200.000.

BBC Brown, Boveri & Company, Ltd.: *See*—
Kramer, Wilhelm; and Grafling, Joachim, 4,315,122, Cl. 200-248.000.

Beacham, Harry H.; and Norris, Robert D., to FMC Corporation. Phosphorus compounds. 4,315,082, Cl. 525-20.000.

Beall, George H.; and Rittler, Hermann L., to Corning Glass Works. Highly refractory glass-ceramics suitable for incorporating radioactive wastes. 4,314,909, Cl. 252-629.000.

Beaman, Norman V., to Robertshaw Controls Company. Capacitance probe for high resistance materials. 4,314,478, Cl. 73-304.00C.

Beck, Boyd R.; Stewart, Lamar H.; Tapp, Steven; Anderson, Don L., Jr.; and Nuffer, Daniel E., to Stewart, Lamar H. Automatically fed distillation and fractionation system. 4,314,890, Cl. 203-1.000.

Becker, Lawrence F., to Baxter Travenol Laboratories, Inc. Venous pressure isolator. 4,314,480, Cl. 73-706.000.

Becker, Rolf: *See*—
Kamp, Heinz; Becker, Rolf; and Stops, Manfred, 4,314,439, Cl. 57-270.000.

Beckerman, Howard L.: *See*—
Wurst, John W.; and Beckerman, Howard L., 4,315,250, Cl. 340-286.00R.

Beckman Instruments, Inc.: *See*—
Horrocks, Donald L., 4,315,151, Cl. 250-362.000.
Monte, Charles S.; and Johnson, Wayne S., 4,314,897, Cl. 204-299.00R.

Bedel, Denis E.: *See*—
Davis, Steven B.; Coyle, Forrest E.; and Bedel, Denis E., 4,314,738, Cl. 339-156.00R.

Beecham Group Limited: *See*—
Gasson, Brian C., 4,314,941, Cl. 260-245.300.
Wootton, Gordon; and Smith, Stephen A., 4,315,022, Cl. 424-273.00R.

Beekenkamp, Gerald, to Black & Decker Inc. Tool guide. 4,314,782, Cl. 408-16.000.

Beffa, Fabio, to Ciba-Geigy Corporation. 1:2 Chromium unsymmetrical complexes of azo and disazo dyes. 4,314,937, Cl. 260-145.00A.

Beghelli, Benito; De Angelis, Vincenzo; and Navone, Mauro, to Merak S.p.A. Composite structures based on polyolefin fibers and process for making same. 4,315,048, Cl. 428-78.000.

Behnke, Wernfried: *See*—
Pfeifer, Friedrich; and Behnke, Wernfried, 4,314,594, Cl. 148-108.000.

Beier, William C.; and Hodder, James J., to Rohm and Haas Company. Process for producing leather. 4,314,802, Cl. 8-94.260.

Beigel, Michael L., to Tavel, Donald L. Music synthesizer. 4,314,496, Cl. 84-1.260.

Bell, Alan E.: *See*—
Bloom, Allen; Seffren, Sidney S.; Bell, Alan E.; and Bartolini, Robert A., 4,315,269, Cl. 346-135.100.

Bell & Howell Company: *See*—
Stocker, Lester H., 4,314,644, Cl. 209-569.000.

Bell Telephone Laboratories, Incorporated: *See*—
Acampora, Anthony; and Reudink, Douglas O., 4,315,262, Cl. 343-100.0ST.
Boros, Victor B.; and Thau, Frederick E., 4,315,316, Cl. 364-483.000.
Chang, Chuan C.; and Kumar, Jitendra, 4,314,855, Cl. 134-3.000.
Ciesielka, Albert J.; and Hawley, George T., 4,315,107, Cl. 179-16.00F.
Flamm, Daniel L., 4,314,875, Cl. 156-643.000.
Fleischer, Paul E.; and Laker, Kenneth R., 4,315,227, Cl. 333-173.000.
Saleh, Adel A. M., 4,315,222, Cl. 330-124.00D.

Belokoskov, Valentin I.: *See*—
Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Belokoskov, Valentin I.; and Plotnikov, Vladimir P., 4,314,975, Cl. 423-81.000.

Beltx Corporation: *See*—
De Woskin, Kenneth J., 4,314,415, Cl. 40-21.00C.

Bendix Corporation, The: *See*—
Hanley, William, 4,314,903, Cl. 210-440.000.
Keresztes, Robert J., 4,314,596, Cl. 152-330.00R.
Kiwak, Robert S., 4,314,566, Cl. 128-204.150.
Mulkins, George F.; Dombrowski, Jerome P.; and Isliker, Gaston R., 4,315,298, Cl. 361-253.000.
Reddy, Junuthula N., 4,314,538, Cl. 123-485.000.

Berazosky, Sandra; and Smith, Harry A., to Dow Chemical Company, The. Curable compositions. 4,314,925, Cl. 260-33.20R.

Bergdolt, Henry F. Sanitary glass holder. 4,314,684, Cl. 248-146.000.

Berger, Fritz; Lauterbach, Udo; and Wetzel, Hermann, to Metzeler Schaum GmbH. Method for the manufacture of molded bodies. 4,314,867, Cl. 156-196.000.

Bergman, Ulf: *See*—
Weigl, Walter; Bergman, Ulf; Baum, Lennart; and Schnitger, Herbert, 4,315,154, Cl. 250-402.000.

Berner, Godwin, to Ciba-Geigy Corporation. Method for light stabilization of two-layer uni-lacquer coatings. 4,314,933, Cl. 260-45.75N.

Bernett, Frank W.; and Svendsen, Peter R., to Digital Equipment Corporation. Disk housing for disk mass storage unit including integral means for reducing temperature differentials among disks. 4,315,288, Cl. 360-98.000.

Bert, Alain; Leclerc, Bernard; and Archambault, Yves, to Thomson-CSF. Acoustic storage device intended in particular for the correlation of two high-frequency signals. 4,315,275, Cl. 357-56.000.

Berthiller, Franz, to Berthiller, Franz. Method and apparatus for the incineration of stalks, especially of straw. 4,314,513, Cl. 110-224.000.

Bettle, Griscom, III; Mills, Howard; and Richter, Edward B., to Procter & Gamble Company, The. Process for making peroxycarboxylic acids. 4,314,949, Cl. 260-502.00R.

Bexford Limited: *See*—
Lambert, Stuart G., 4,315,066, Cl. 430-271.000.

Bey, Philippe; and Jung, Michel, to Merrell Toraude et Compagnie. α-Halomethyl derivatives of amino acids. 4,315,095, Cl. 548-344.000.

Biblarz, Oscar, to United States of America, Navy. Staircase electrode-wall configuration for MHD generators. 4,315,169, Cl. 310-11.000.

Bickel, Gary W., to International Telephone and Telegraph Corporation. Optical fiber beam splitter coupler. 4,314,740, Cl. 350-96.150.

Biegenzein, Gunter, to Novophalt SA. Method and apparatus for preparing a bituminous binder. 4,314,921, Cl. 260-28.5A.S.

Biehl, Reinhard; and Schmalbein, Dieter, to Bruker Analytische Messtechnik GmbH. Test head producing different frequencies for endor-triple experiments. 4,315,230, Cl. 333-227.000.

Bienville, Frank. Multipower electrical system for supplying electrical energy to a house or the like. 4,315,163, Cl. 307-66.000.

Bier, Peter; and Binsack, Rudolf, to Bayer Aktiengesellschaft. Polyethylene terephthalates which crystallize rapidly and a process for their preparation. 4,314,928, Cl. 260-40.00R.

Bifok AB: *See*—
Hansen, Elo H.; and Ruzicka, Jaromir, 4,314,824, Cl. 23-230.00R.

Billeck, Frank D.: *See*—
Narens, Robert L.; and Billeck, Frank D., 4,314,418, Cl. 40-358.000.

Bilsom AB: *See*—
Westerdal, Roland, 4,314,553, Cl. 128-152.000.

Binder, Ira; and Tesss, Horace A., Jr., to McNab Incorporated. System for measurement of specific ions, such as sodium. 4,314,896, Cl. 204-195.00R.

Binder, Johann V. Sugar cane planter. 4,314,514, Cl. 111-3.000.

Binsack, Rudolf: *See*—
Bier, Peter; and Binsack, Rudolf, 4,314,928, Cl. 260-40.00R.

Bio Research Center Company Ltd.: *See—*
Takagi, Motoyoshi, 4,314,854, Cl. 127-37.000.
Bird & Son, Inc.: *See—*
Cunning, Joseph M., 4,314,683, Cl. 248-48.200.
Birenberg, Isaak E.: *See—*
Karpov, Evgeny F.; Birenberg, Isaak E.; Basovsky, Boris I.; and Popov, Vladimir V., 4,314,475, Cl. 73-27.00R.
Birkmeyer, William J.; Lewarchik, Ronald J.; Klanica, Joseph A.; and Anderson, Carl C., to PPG Industries, Inc. Coating compositions containing organic alcoholic reactive diluents. 4,314,918, Cl. 260-20.000.
Bitakaramire, Peter K., to Vaccines International Limited. Process for producing fascioliasis vaccine. 4,314,992, Cl. 424-88.000.
Bjurman, James M., to Multi-Flex Corporation. Resilient sprinkler nipple. 4,314,717, Cl. 285-5.000.
Black & Decker Inc.: *See—*
Beekenkamp, Gerald, 4,314,782, Cl. 408-16.000.
Blackert, Hanno: *See—*
Lueg, Heinz; Blackert, Hanno; Wimmenauer, Dirk; and Hermanns, Winfried, 4,315,242, Cl. 340-38.00L.
Blades, Frederick K., to PureCycle Corporation. Echo ranging pulse discrimination circuit. 4,315,325, Cl. 367-98.000.
Blank, Heinz U.: *See—*
Bonse, Gerhard; Blank, Heinz U.; and Kratzer, Hans, 4,315,094, Cl. 544-182.000.
Pfister, Theodor; Schenk, Wolfgang; and Blank, Heinz U., 4,314,950, Cl. 260-543.00R.
Blankenship, Michael G., to Corning Glass Works. Reactant delivery system method. 4,314,837, Cl. 65-3.120.
Block, Dieter; Gesell, Reinhard; and Peters, Hans-Werner, to Dr. Ing. Rudolf Hell GmbH. Thermic developing stations. 4,315,136, Cl. 219-216.000.
Blomqvist, Berthold. Stackable pallet collar. 4,314,649, Cl. 220-4.00F.
Bloom, Allen; Seffren, Sidney S.; Bell, Alan E.; and Bartolini, Robert A., to RCA Corporation. Thick protective overcoat layer for optical video disc. 4,315,269, Cl. 346-135.100.
Blough, Herbert A. 2-Deoxy glucose as an antiviral agent against herpes simplex. 4,315,001, Cl. 424-180.000.
Blount, David H. Process for the production of broken down lignin-cellulose silicate copolymers. 4,314,916, Cl. 260-13.000.
Blum, Alvin S. Molecular separation and isoenzyme analyzers. 4,314,971, Cl. 422-82.000.
Boden, Heinrich; and Schneider, Walter, to Bayer Aktiengesellschaft. Method of filling cavities, in particular, mold cavities, with a reactive flowable mixture. 4,314,955, Cl. 264-51.000.
Boden, Heinrich; Rentz, Bernhard; Niggemann, Johann; and Just, Gerhard, to Bayer Aktiengesellschaft. Method and a device for producing shaped articles from a multi-component reaction mixture. 4,314,963, Cl. 264-328.600.
Boeckel, John W.; Rohde, Vernon C.; and Wells, John R., to Du Pont de Nemours, E. I., and Company. Centrifuge rotor apparatus for preparing particle spreads. 4,314,523, Cl. 118-50.000.
Boehmer, Matthew A.: *See—*
Kremer, Lawrence N.; and Boehmer, Matthew A., 4,314,876, Cl. 156-664.000.
Boeing Company, The: *See—*
Dadone, Leone U., 4,314,795, Cl. 416-223.00R.
Deminet, Czeslaw; and Kenney, James F., 4,314,741, Cl. 350-96.330.
Boessler, Hanns: *See—*
Monsheimer, Rolf; Pfleiderer, Ernst; Siol, Werner; Boessler, Hanns; and Trabitzsch, Hans, 4,314,800, Cl. 8-94.10R.
Bogese, Charles E.; and Bogese, Stephen B., II, to Virginia Patent Development Corp. Cable assembly having shielded conductor and method of making same. 4,314,737, Cl. 339-99.00R.
Bogese, Stephen B., II: *See—*
Bogese, Charles E.; and Bogese, Stephen B., II, 4,314,737, Cl. 339-99.00R.
Bogren, Leif. Transport device mainly intended for pulling tree trunks and similar loads. 4,314,511, Cl. 104-173.00R.
Bonney, Oren V., to Amstar Corporation. Recovery of magnesium as magnesium hydroxide from sea water. 4,314,985, Cl. 423-636.000.
Bonse, Gerhard; Blank, Heinz U.; and Kratzer, Hans, to Bayer Aktiengesellschaft. Preparation of 4-amino-6-tert.-butyl-3-alkylthio-1,2,4-triazin-5(4H)-one. 4,315,094, Cl. 544-182.000.
Boogerd, Gert M.: *See—*
Konijnendijk, Willem L.; Boogerd, Gert M.; and Tonnaer, Henricus L. M., 4,315,191, Cl. 313-486.000.
Borg-Warner Corporation: *See—*
Harnish, James R., 4,314,456, Cl. 62-181.000.
Siemon, Edward C., 4,315,305, Cl. 363-88.000.
Boros, Victor B.; and Thau, Frederick E., to Bell Telephone Laboratories, Incorporated. Digital arrangement for determining average current of a circuit by monitoring a voltage. 4,315,316, Cl. 364-483.000.
Bosch-Siemens Hausgerate GmbH: *See—*
Schotten, Henno, 4,314,666, Cl. 236-78.00R.
Boston University, The Trustees of: *See—*
Apstein, Carl S., 4,314,550, Cl. 128-1.00D.
Bouk, Barbara, heir: *See—*
Bouk, Raymond S., deceased; and Bouk, Barbara, heir, 4,314,902, Cl. 208-254.00R.
Bouk, Raymond S., deceased; and by Bouk, Barbara, heir. Catalytic water wash. 4,314,902, Cl. 208-254.00R.
Bowman, Charles W. Solar hot water generator. 4,314,545, Cl. 126-424.000.
Bowman, Robert J., to University of Utah Research Foundation. Self-compensating optical drop count apparatus for measuring volumetric fluid flow. 4,314,484, Cl. 73-861.410.
Branson Ultrasonics Corporation: *See—*
Holze, Ernest P., Jr., 4,315,181, Cl. 310-323.000.
Bratko, Rudolph S., to Slyman Manufacturing Corporation. Infra-red domestic furnace. 4,314,542, Cl. 126-110.00R.
Brauer, Gerhard; Adam, Peter; and Seuffert, Werner, to Kuster & Co. GmbH; and Siemens Aktiengesellschaft. Electric motor-driven rope pull hoist for motor vehicle doors. 4,314,692, Cl. 254-362.000.
Bregman, Harry L.: *See—*
Weinstock, Harry; and Bregman, Harry L., 4,314,871, Cl. 156-258.000.
Brehm, William F.: *See—*
McGuire, Joseph C.; and Brehm, William F., 4,314,880, Cl. 376-146.000.
Breininger, J. Shannon; and Greenberg, Charles B., to PPG Industries, Inc. Direct electroless deposition of cuprous oxide films. 4,315,055, Cl. 428-434.000.
Bremer, Edgar W. Air operated clock. 4,315,327, Cl. 368-65.000.
Brennan, John J.; and Prewo, Karl M., to United Technologies Corporation. Silicon carbide fiber reinforced glass composites. 4,314,852, Cl. 501-88.000.
Briar, Jack E. Pressure jet spray apparatus. 4,314,671, Cl. 239-311.000.
Bricker, Robert E.; and Humpleby, Paul J., to Litton Industrial Products, Inc. Coolant assembly for a cylindrical grinding machine. 4,314,425, Cl. 51-267.000.
Brickman, Norman F.; and Graziano, Bruno R., to International Business Machines Corporation. Multiple data rate testing of communication equipment. 4,315,330, Cl. 370-104.000.
Brinkel, Edwin P.; and Dellach, Philip J., to ISI Fluid Power, Inc. Safety control system for double-acting cylinder. 4,314,502, Cl. 91-438.000.
Brister, Beryle D. Installation, hydrostatic testing, repair and modification of large diameter fluid transmission lines. 4,314,577, Cl. 137-13.000.
British Aerospace: *See—*
Stevens, James W., 4,314,892, Cl. 204-38.00B.
Brock Manufacturing, Inc.: *See—*
Grossman, Rodney, 4,314,675, Cl. 241-95.000.
Brock, William L. Surface roller. 4,314,395, Cl. 29-110.500.
Bromwell, Michael A. J. Overcladding structure for a roof. 4,314,428, Cl. 52-22.000.
Bronisz, Larry F.; and Sahr, Eugene V., to Data General Corporation. Cassette recorder system for loading programs. 4,315,323, Cl. 364-900.000.
Bronne, Henri, to S.A.M. Silvatrim. Rack for flexible shapes. 4,314,641, Cl. 206-443.000.
Brown, Daniel R.: *See—*
Madsen, James B.; and Brown, Daniel R., 4,314,829, Cl. 55-98.000.
Brown, Karen K.; and Stewart, Richard C., to Cutter Laboratories, Inc. Titration of serum influenza antibody using plaque reduction neutralization test. 4,315,073, Cl. 435-5.000.
Broyles, Harry C.; and Szalvay, Laszlo, to Raychem Corporation. Tensile ring composite pipe coupling. 4,314,718, Cl. 285-114.000.
Bruker Analytische Messtechnik GmbH: *See—*
Biehl, Reinhard; and Schmalbein, Dieter, 4,315,230, Cl. 333-227.000.
Brumfield, Jesse E.: *See—*
Brumfield, Maxine L.; and Brumfield, Jesse E., 4,314,697, Cl. 272-136.000.
Brumfield, Maxine L.; and Brumfield, Jesse E. Physical exercising device. 4,314,697, Cl. 272-136.000.
Bruni, Ludovico, to Associated Engineering Italy S.p.A. Pistons and cylinder liners. 4,314,531, Cl. 123-193.0CP.
Brunson, William W.: *See—*
Stewart, Maxson L.; Odle, Robert R.; and Brunson, William W., 4,314,976, Cl. 423-139.000.
Buchanan, John G.; and MacBean, Donald G., to JWI Ltd. Duplex forming fabric. 4,314,589, Cl. 139-383.00A.
Buckley, Stephen M.: *See—*
Dawson, John; and Buckley, Stephen M., 4,315,202, Cl. 318-718.000.
Bud, Hans; and Alway, Peter, to Mecom Standard Limited. Electrical impulse operated number wheel counters. 4,315,144, Cl. 235-92.00C.
Budd Company, The: *See—*
Weinhaus, Harold R., 4,314,384, Cl. 9-310.00A.
Bull, James E., to Texas Woods Instruments, Inc. Exhaust skimming. 4,314,446, Cl. 60-279.000.
Bullington, John G.; and Tate, Lemmie D. Stove safety guard. 4,314,543, Cl. 126-201.000.
Bure, Jacques: *See—*
Vincent, Michel; Remond, Georges; and Bure, Jacques, 4,315,031, Cl. 424-309.000.
Burk, Raymond D., to Monsanto Company. Process for the continuous mass polymerization of polyblends. 4,315,083, Cl. 525-53.000.
Burroughs Corporation: *See—*
Demnianiuk, Eugene F., 4,314,736, Cl. 339-74.00R.
McKee, Joseph E.; and Lee, James Y., 4,315,259, Cl. 340-799.000.
Busch, Peter: *See—*
Rose, David; Busch, Peter; Lieske, Edgar; and Konrad, Gunther, 4,314,809, Cl. 8-406.000.
Byk-Mallinckrodt Chemische Produkte GmbH: *See—*
Haubennestel, Karlheinz; and Mehren, Rainer, 4,314,924, Cl. 260-30.60R.

Cain, James T., to JNPC Investments (Proprietary) Limited. Motor vehicle registration plate holder. 4,314,417, Cl. 40-209.000.
Calbert, Raymond E.; and Morse, Herbert E., to Delta Design, Inc. Feed and storage track for DIP devices. 4,314,628, Cl. 193-2.00R.
Calfo, Raymond M.; Alkire, Gerald R.; Dailey, George F.; and Mulach, Arthur, to Westinghouse Electric Corp. Dynamoelectric machines segmental air gap baffle assembly. 4,315,173, Cl. 310-53.000.
California Institute of Technology: *See—*
Hsu, George C.; Levin, Harry; Hogle, Richard A.; Praturi, Ananda; and Lutwack, Ralph, 4,314,525, Cl. 118-716.000.
Callahan, Michael J., Jr.: *See—*
Hoffman, Gordon B.; and Callahan, Michael J., Jr., 4,315,108, Cl. 179-84.0VF.
Calloni, Angelo: *See—*
Leoni, Roberto; Baldini, Alberto; Calloni, Angelo; and Angelini, Gianfranco, 4,314,959, Cl. 264-187.000.
Calvert, Edmund, administrator: *See—*
Liddell, Peter R.; Pearl, Antony S., desceased; and Calvert, Edmund, administrator, 4,314,764, Cl. 356-315.000.
Calvert, Willard R., Sr. Unused fuel indicator for automotive engines employing catalytic converters. 4,315,243, Cl. 340-52.00R.
Cam Gears Limited: *See—*
Adams, Frederick J., 4,314,485, Cl. 74-200.000.
Canada, Her Majesty the Queen in Right of, as represented by the Minister of National Defence: *See—*
Couture, Joseph E. G.; and Roy, Joseph N. A., 4,315,043, Cl. 427-212.000.
Canadian Patents & Development Limited: *See—*
Rocheleau, David; and Ayukawa, Karl, 4,315,219, Cl. 328-14.000.
Cannon, Raymond E., to IMED Corporation. Drop controller. 4,314,567, Cl. 128-214.00F.
Canon Kabushiki Kaisha: *See—*
Amitani, Joji; Ito, Takashi; and Hirayama, Kazuhiro, 4,314,756, Cl. 355-15.000.
Fukuda, Tadaji; and Misumi, Teruo, 4,315,063, Cl. 430-65.000.
Kawabata, Takashi; Hosoe, Kazuyas; Shinoda, Nobuhiko; Sakai, Shinji; and Kinoshita, Takao, 4,314,748, Cl. 354-25.000.
Kuwayama, Tetsuro; and Tanaka, Kazuo, 4,315,279, Cl. 358-44.000.
Niwa, Yukichi; Owada, Mitsutoshi; Asano, Noriyuki; Ogawa, Masahiko; and Tamura, Shuichi, 4,315,159, Cl. 250-578.000.
Shimizu, Katsuichi; Sawamura, Osamu; Masuda, Shunichi; Tomosada, Masahiro; and Sakamaki, Hisashi, 4,314,754, Cl. 355-14.00C.
Suzuki, Akiyoshi; Hiraga, Ryozo; Kano, Ichiro; Yoshinari, Hideki; Totsuka, Masao; Kato, Yuzo; and Ogino, Yasuo, 4,315,201, Cl. 318-640.000.
Tazaki, Shigemitsu, 4,315,268, Cl. 346-17.000.
Yamada, Yasuaki; Ozawa, Toshiaki; and Kondo, Hiroatsu, 4,315,200, Cl. 318-603.000.
Cantrel, James F., to Ingersoll-Rand Co. Friction rock stabilizer and method for inserting thereof in an earth structure bore. 4,314,778, Cl. 405-259.000.
Carkhuff, Donald W.: *See—*
Schaefer, Peter R.; and Carkhuff, Donald W., 4,315,126, Cl. 219-70.000.
Carmel, Amos: *See—*
Yaron, Arieh; and Carmel, Amos, 4,314,936, Cl. 260-112.50R.
Carrier Corporation: *See—*
Gray, Kenneth P., 4,314,447, Cl. 60-671.000.
Carson Products Company: *See—*
de la Guardia, Mario; and Cowsar, Donald R., 4,314,572, Cl. 132-7.000.
Carstab Corporation: *See—*
Smith, Kenneth V.; and Taylor, Jack D., 4,314,934, Cl. 260-45.75S.
Cartier, Roger J.; and Krolzick, Gordon J., to Whirlpool Corporation. Automatic lint screen cleaner and storage system for dryer. 4,314,409, Cl. 34-82.000.
Casals, Jorge: *See—*
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Mannesmann, Gerda; Losert, Wolfgang; and Casals, Jorge, 4,315,013, Cl. 424-263.000.
Casteel, Ernest; and Spector, George. Siding holder. 4,314,429, Cl. 52-127.000.
Caterpillar Tractor Co.: *See—*
Hansen, Robert C., 4,314,621, Cl. 181-233.000.
Westendorf, Gail F., 4,314,711, Cl. 280-154.000.
Causse, Jean-Marie; and Sarre, Andre F. M., to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). Diagnostic system for a data processing system. 4,315,311, Cl. 364-200.000.
Cecil, Joseph L.: *See—*
Elmore, Jimmy D.; and Cecil, Joseph L., 4,315,044, Cl. 427-386.000.
Celanese Corporation: *See—*
Elmore, Jimmy D.; and Cecil, Joseph L., 4,315,044, Cl. 427-386.000.
Cerf, Olivier; Grenier, Georges; Hermier, Jean; and Rancurel, Alain, to Laboratoires Pharmascience. Sterilization process using a heat effect additive. 4,314,965, Cl. 422-28.000.
Cerny, Daryl D.; and Lining, Kurt, to Ball Corporation. Wire electrode assemblage having arc suppression means and extended fatigue life. 4,315,188, Cl. 313-269.000.
Cerroni, Manlio. Process for separating the paper from the plastic existing in the urban solid waste. 4,314,674, Cl. 241-14.000.
Chandrasekaran, Santosh K., to ALZA Corporation. Dissolution controlled active agent dispenser. 4,314,557, Cl. 128-260.000.
Chang, Chuan C.; and Kumar, Jitendra, to Bell Telephone Laboratories, Incorporated. Method of cleaning test probes. 4,314,855, Cl. 134-3.000.
Chang, Wen-Hsuan; Piccirilli, Robert; and Diehl, David A., to PPG Industries, Inc. Coating compositions formulated from polyols modified by reaction with glycidyl ether. 4,314,923, Cl. 260-29.40R.
Chaplin, Gary F., to United Technologies Corporation. Turbine seal and vane damper. 4,314,792, Cl. 415-116.000.
Chaplin, Gary F.: *See—*
DeTolla, Francis L.; and Chaplin, Gary F., 4,314,793, Cl. 415-135.000.
Chase, Jay V., Jr., to United States of America, Navy. Inertial measurement underwater tracking system. 4,315,326, Cl. 367-134.000.
Chauvet, Robert. Apparatus for the preparation of the soil. 4,314,609, Cl. 172-54.500.
Chea, Ramon C. W., Jr., to International Telephone and Telegraph Corporation. Apparatus for regulating current supplied to a telephone line signal of the type employed in digital telephone systems. 4,315,106, Cl. 179-16.00F.
Chemineer, Inc.: *See—*
Libby, Donald R.; and Chen, Sung J., 4,314,974, Cl. 423-8.000.
Chen, James M.: *See—*
Shen, Ming-Shing; Chen, James M.; and Yang, Ralph T., 4,314,980, Cl. 423-331.000.
Chen, Sung J.: *See—*
Libby, Donald R.; and Chen, Sung J., 4,314,974, Cl. 423-8.000.
Cheong, Chan W. Rotary insect trap. 4,314,421, Cl. 43-111.000.
Chevron Research: *See—*
Danley, Michael M., 4,315,025, Cl. 424-274.000.
Chevron Research Company: *See—*
Sigworth, Harry W., Jr., 4,314,667, Cl. 236-93.00R.
Chicago Bridge & Iron Company: *See—*
Engdahl, Gerald E., 4,314,455, Cl. 62-124.000.
Chin, Hsiao-Ling M.; and Pallos, Ferenc M., to Stauffer Chemical Company. N-Haloalkyl thiobenzcyanoanilides and their use as fungicides. 4,315,030, Cl. 424-304.000.
Chinone, Naoki; Saito, Kazutoshi; Shige, Noriyuki; and Ito, Ryoichi, to Hitachi, Ltd. Semiconductor laser device. 4,315,226, Cl. 372-45.000.
Chloride Group Limited: *See—*
Schwendener, Derek K.; Ainsworth, Neil L.; and Foss, Richard J., 4,315,058, Cl. 429-84.000.
Chow, Shing C., to Nam Kwong Electric Co. Ltd. Stroboscopic discharge tube for photography. 4,315,187, Cl. 313-217.000.
Christie, George A.: *See—*
Kluge, Arthur F.; Strosberg, Arthur M.; Whiting, Roger; and Christie, George A., 4,315,021, Cl. 424-273.00R.
Ciba Geigy AG: *See—*
Scott, John G. V.; and Harvey, Anthony K., 4,315,069, Cl. 430-365.000.
Ciba-Geigy Corporation: *See—*
Beffa, Fabio, 4,314,937, Cl. 260-145.00A.
Berner, Godwin, 4,314,933, Cl. 260-45.75N.
Model, Ernst, 4,314,938, Cl. 260-165.000.
Mollet, Hans, 4,314,815, Cl. 8-524.000.
Weber, Kurt; and Meyer, Hans R., 4,314,820, Cl. 8-648.000.
Ciesielka, Albert J.; and Hawley, George T., to Bell Telephone Laboratories, Incorporated. Telephone range extender with gain. 4,315,107, Cl. 179-16.00F.
Cillario, Renzo. Package comprising a creamy confectionery product. 4,314,650, Cl. 220-23.830.
Claffey, Kevin: *See—*
Spitzer, J. George; Marra, Dorothea C.; Osipow, Lloyd I.; and Claffey, Kevin, 4,314,573, Cl. 132-7.000.
Clarizio, Donald M., to Duracell International Inc. Method for the manufacture of a polystyrene separator and cell. 4,315,062, Cl. 429-246.000.
Clark, John D., to Praet, Larry Raymond, a part interest. Security bar for sliding door or window. 4,314,721, Cl. 292-262.000.
Clarke, Robert: *See—*
Michel, Thomas J.; and Clarke, Robert, 4,315,210, Cl. 324-57.00R.
Clauss, Richard J., to Hooker Chemicals & Plastics Corp. Production of multiple zinc-containing coatings. 4,314,893, Cl. 204-40.000.
Clow, Hugh; and Walters, Peter E., to E M I Limited. Imaging systems. 4,315,216, Cl. 324-309.000.
Coal Industry (Patents) Limited: *See—*
Plumpton, Norman A.; and Tomlin, Malcolm G., 4,314,730, Cl. 299-75.000.
Cole, Loren F., Jr. Vehicle alarms. 4,315,244, Cl. 340-63.000.
Coleman, Howard G.: *See—*
Nunlist, Erwin J.; Coleman, Howard G.; and Harrison, Edward S., 4,314,396, Cl. 29-156.80R.
Coli, Robert D. Integrated medical test data storage and retrieval system. 4,315,309, Cl. 364-200.000.
Collins, John J.: *See—*
Zrostlik, Francis L.; and Collins, John J., 4,314,597, Cl. 157-1.110.
Columbia Marking Tools, Inc.: *See—*
Krembel, Frank, Jr., 4,314,505, Cl. 101-85.000.
Combeau, Guy, to Machines Dubuit. Pad transfer printing machine. 4,314,504, Cl. 101-41.000.
Combustion Engineering, Inc.: *See—*
Hackett, Charles D., 4,314,587, Cl. 138-38.000.
Comer, William T.: *See—*
Kreighbaum, William E.; and Comer, William T., 4,314,943, Cl. 260-326.13B.

Commissariat a L'Energie Atomique: *See—*
Etienne, Claude; Fardouet, Claude; and Mercier L'Abbe, Guy, 4,314,882, Cl. 376-235.000.
Gerardot, Claude; and Romero, Georges, 4,315,099, Cl. 174-47.000.
Commodities Trading & Development Ltd.: *See—*
Aspa, Andre J., 4,314,973, Cl. 422-209.000.
Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme): *See—*
Causse, Jean-Marie; and Sarre, Andre F. M., 4,315,311, Cl. 364-200.000.
Lazzari, Jean-Pierre, 4,315,291, Cl. 360-113.000.
Concordia Sprecher Schaltgerate GmbH: *See—*
Globig, Manfred, 4,315,120, Cl. 200-146.00R.
Connolly, Denis J., to United States of America, National Aeronautics and Space Administration. Coupled cavity traveling wave tube with velocity tapering. 4,315,194, Cl. 315-3.600.
Conoco Inc.: *See—*
Kulik, Metro D., 4,314,977, Cl. 423-235.000.
Theodore, Frank W.; and Wasson, George E., 4,314,900, Cl. 208-126.000.
Conti, Gianni. Knitting machine with latchless needles cooperating with external hook-type elements. 4,314,461, Cl. 66-13.000.
Control Technology, Incorporated: *See—*
Ferguson, Frank T., 4,315,162, Cl. 307-66.000.
Controlonics Corporation: *See—*
Mosher, Richard K., 4,315,261, Cl. 343-18.00E.
Cook, P. Dan, to Warner-Lambert Company. β-D-Arabinofuranosylimidazo(4,5-c)pyridine compounds and methods for their production. 4,315,000, Cl. 424-180.000.
Cooper, Douglas E. Multi-component package dispensing method. 4,314,652, Cl. 222-1.000.
Cooper, Glenn D.; Lee, Gim F., Jr.; and Shufelt, Rainey A., to General Electric Company. Polyphenylene ether molding compositions that include an alkenyl aromatic resin and EPDM rubber. 4,315,084, Cl. 525-69.000.
Cooper Laboratories, Inc.: *See—*
Abelson, Mark B., 4,315,024, Cl. 424-273.00R.
Copeland, Peter. Recorders. 4,315,286, Cl. 360-72.200.
Corbman, Philip; and Faber, Paul V., to Wilputte Corporation. Zone control of lean gas underfiring for coke ovens. 4,314,888, Cl. 202-143.000.
Corda, Giuseppe: *See—*
Daniele, Vincenzo; Corda, Giuseppe; Ravaglia, Andrea; and Ferla, Giuseppe, 4,315,239, Cl. 338-308.000.
Corning Glass Works: *See—*
Allen, Richard E., 4,314,559, Cl. 128-303.140.
Beall, George H.; and Rittler, Hermann L., 4,314,909, Cl. 252-629.000.
Blankenship, Michael G., 4,314,837, Cl. 65-3.120.
Courtin, Alfred, to Sandoz Ltd. 1-Amino-7-[3'-(5''-chloro-2'',4''-difluoropyrimidyl-6''-amino)-6'-sulfophenylazo]-8-hydroxy-2-sulfamoyl or substituted sulfamoyl-phenylazo naphthalene-3,6-disulfonic acids. 4,314,818, Cl. 8-549.000.
Couture, Joseph E. G.; and Roy, Joseph N. A., to Canada, Her Majesty the Queen in Right of, as represented by the Minister of National Defence. Coating of granulated organic dyes with an epoxy. 4,315,043, Cl. 427-212.000.
Cowsar, Donald R.: *See—*
de la Guardia, Mario; and Cowsar, Donald R., 4,314,572, Cl. 132-7.000.
Cox, George W.: *See—*
Bayliss, John A.; Cox, George W.; Forbes, Bert E.; and Kahn, Kevin C., 4,315,310, Cl. 364-200.000.
Coyle, Forrest E.: *See—*
Davis, Steven B.; Coyle, Forrest E.; and Bedel, Denis E., 4,314,738, Cl. 339-156.00R.
Cramer, Hans-Dieter: *See—*
Kramer, Manfred; Schmid, Werner; and Cramer, Hans-Dieter, 4,315,118, Cl. 200-80.00R.
Crane Packing Limited: *See—*
Wichall, Colin A., 4,314,704, Cl. 277-27.000.
Crankshaw, Michael, to Label-Aire. Wine bottle labeler. 4,314,869, Cl. 156-215.000.
Crescenzo, Francis C.: *See—*
LaFleur, Paul J., Jr.; and Crescenzo, Francis C., 4,314,785, Cl. 414-46.000.
Crockett, Ray K.: *See—*
Palmer, Harry E.; Stenning, David G. C.; and Crockett, Ray K., 4,314,776, Cl. 405-205.000.
Crown City Plating Co.: *See—*
Dillard, David A.; Maguire, Eileen; and Donovan, Lawrence P., 4,315,045, Cl. 427-307.000.
Crutchfield, E. Bryant: *See—*
Gaiser, William R.; Crutchfield, E. Bryant; and Bartley, Harold D., 4,314,651, Cl. 220-326.000.
Crutchfield, Marvin M.; Papanu, Victor D.; and Warren, Craig B., to Monsanto Company. Polyacetal carboxylates. 4,315,092, Cl. 528-230.000.
Cunning, Joseph M., to Bird & Son, Inc. Gutter hanger. 4,314,683, Cl. 248-48.200.
Cushman Industries, Incorporated: *See—*
Pruden, Samuel H., 4,314,706, Cl. 279-1.00C.
Cutter Laboratories, Inc.: *See—*
Brown, Karen K.; and Stewart, Richard C., 4,315,073, Cl. 435-5.000.
Cybernet Electronics Corporation: *See—*
Kakigi, Yasugi; and Kakigi, Takao, 4,315,158, Cl. 250-574.000.
Dadone, Leone U., to Boeing Company, The. Advanced airfoils for helicopter rotor application. 4,314,795, Cl. 416-223.00R.
Dagostine, Leslie J., to Somerville Belkin Industries Limited. Cardboard container with reclosable top closure. 4,314,642, Cl. 206-621.000.
Dahms, Harald. Thermostat range controller. 4,315,137, Cl. 219-391.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Nishikawa, Seiichi; and Honda, Makoto, 4,315,145, Cl. 235-493.000.
Dailey, George F.: *See—*
Calfo, Raymond M.; Alkire, Gerald R.; Dailey, George F.; and Mulach, Arthur, 4,315,173, Cl. 310-53.000.
Dainippon Screen Seizo Kabushiki Kaishi: *See—*
Tsuda, Masanori, 4,315,280, Cl. 358-80.000.
Dalcon Marketing Inc.: *See—*
Hade, Conrad; and Robinson, Dale D., 4,314,458, Cl. 62-256.000.
Dalet, Francis A., to Societe Nationale des Poudres et Explosifs. Pyrotechnic charge, with a short combustion time, comprising inclined plates of propellant and deflectors, and a propulsion system using a charge of this type. 4,314,509, Cl. 102-288.000.
Dancsi, Lajos: *See—*
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; and Drexler, Ferenc, 4,314,939, Cl. 260-239.30P.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyoorgy; Dancsi, Lajos; Keve, Tibor; Karpati, Egon; and Szporny, Laszlo, 4,315,011, Cl. 424-262.000.
Daniele, Vincenzo; Corda, Giuseppe; Ravaglia, Andrea; and Ferla, Giuseppe, to SGS Ates, Componenti Elettronici S.P.A. Process for producing a calibrated resistance element and integrated circuitry incorporating same. 4,315,239, Cl. 338-308.000.
Danley, Michael M., to Chevron Research. Roughage animal feed. 4,315,025, Cl. 424-274.000.
Darby, David L.: *See—*
Darby, James W.; and Darby, David L., 4,314,390, Cl. 27-35.000.
Darby, James W.; and Darby, David L. Composite burial vault and method for making same. 4,314,390, Cl. 27-35.000.
Darringer, Richard E.; Scharf, Wayne L.; and Haggerty, James S., to Telatemp Corporation. Targeted infrared thermometer. 4,315,150, Cl. 250-338.000.
Darrow, John O. G.: *See—*
McElroy, John M.; and Darrow, John O. G., 4,315,208, Cl. 323-303.000.
Dassler, Adolf. Sports shoe. 4,314,413, Cl. 36-129.000.
Data General Corporation: *See—*
Bronisz, Larry F.; and Sahr, Eugene V., 4,315,323, Cl. 364-900.000.
D'Attoma, Angelo M.: *See—*
Wilkinson, Harold C.; D'Attoma, Angelo M.; and Walker, Stephen W., 4,315,129, Cl. 219-99.000.
Davey, Kent R., to Westinghouse Electric Corp. Double layered stator peripheral end windings. 4,315,179, Cl. 310-184.000.
Davis, C. Arthur. Strap cutter and method. 4,314,400, Cl. 29-426.400.
Davis, James M., to International Telephone and Telegraph Corporation. Multiple line telephone instrument. 4,315,110, Cl. 179-99.00M.
Davis, Steven B.; Coyle, Forrest E.; and Bedel, Denis E., to Westinghouse Electric Corp. Auxiliary equipment enclosure unit for watthour meter sockets. 4,314,738, Cl. 339-156.00R.
Davy International AG: *See—*
Knobel, Walter, 4,314,891, Cl. 203-18.000.
Dawson, John; and Buckley, Stephen M., to Associated Electrical Industries Limited. Synchronous motors. 4,315,202, Cl. 318-718.000.
de la Guardia, Mario; and Cowsar, Donald R., to Carson Products Company. Method and composition for hair treatment. 4,314,572, Cl. 132-7.000.
Deabriges, Jean, to PCUK Produits Chimiques Ugine Kuhlmann. Industrial process for continuous production of zeolite A. 4,314,979, Cl. 423-329.000.
De Angelis, Vincenzo: *See—*
Beghelli, Benito; De Angelis, Vincenzo; and Navone, Mauro, 4,315,048, Cl. 428-78.000.
De Barbieri, Augusto, to Proter S.p.A. N-Acyl derivatives of glucosamine having antitumor chemotherapeutic acitivity. 4,314,999, Cl. 424-177.000.
DeBenedictis, Henry J.: *See—*
Perakis, Mike; and DeBenedictis, Henry J., 4,314,657, Cl. 222-162.000.
DeBusscher, Cyriel R. J.; and Strubbe, Gilbert J. I., to Sperry Corporation. Combine harvester. 4,314,571, Cl. 130-27.200.
DeCristofaro, Nicholas J.; and Sexton, Peter, to Allied Corporation. Homogeneous, ductile brazing foils. 4,314,661, Cl. 228-263.00R.
Deere & Company: *See—*
Riewerts, Paul R.; and Wolak, David J., 4,314,610, Cl. 172-776.000.
Defretin, Francis; Eudeline, Jean-Paul; Schoch, Elisabeth; and Voisin, Alain, to PCUK Produits Chimiques Ugine Kuhlmann. Oil additive compositions for internal combustion engines. 4,314,907, Cl. 252-22.000.
Deguchi, Osamu, to NTN Toyo Bearing Company, Limited. Apparatus for transfer and treatment of apertured articles. 4,314,524, Cl. 118-54.000.
Dellach, Philip J.: *See—*
Brinkel, Edwin P.; and Dellach, Philip J., 4,314,502, Cl. 91-438.000.
Delta Design, Inc.: *See—*
Calbert, Raymond E.; and Morse, Herbert E., 4,314,628, Cl. 193-2.00R.

Deluca, Domenico: *See—*
Giannini, Umberto; Longi, Paolo; Deluca, Domenico; and Pricca, Angelo, 4,314,911, Cl. 252-429.00A.
Demaine, David G. A.: *See—*
Stillwell, Peter F. T. C.; Moore, William T.; and Demaine, David G. A., 4,315,284, Cl. 358-209.000.
Deminet, Czeslaw; and Kenney, James F., to Boeing Company, The. Intrusion-free optical cable. 4,314,741, Cl. 350-96.330.
Demnianiuk, Eugene F., to Burroughs Corporation. Zero insertion force connector for a package with staggered leads. 4,314,736, Cl. 339-74.00R.
Demoute, Jean-Pierre: *See—*
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,315,012, Cl. 424-263.000.
de Neui, Richard P.: *See—*
Seabold, Thomas W.; Patterson, Richard A.; and de Neui, Richard P., 4,315,047, Cl. 428-64.000.
Dennis, John R. Chimney fire detector. 4,315,256, Cl. 340-590.000.
Denny, William D., Jr.; and Wetzel, Thomas A., to Procter & Gamble Company, The. Toothpaste compositions. 4,314,990, Cl. 424-52.000.
Deppisch, Gerd: *See—*
Redel, Karl-Georg; and Deppisch, Gerd, 4,315,195, Cl. 315-107.000.
Dermarderosian, Aaron, to United States of America, Navy. Crack detection by vapor condensation. 4,314,474, Cl. 73-15.0FD.
Deroode, Jean R., to Essilor International, Cie Generale d'Optique. Method of and apparatus for decorating substrates. 4,314,814, Cl. 8-471.000.
Derrer, Hans-Rudolf: *See—*
Wolfer, Peter; Derrer, Hans-Rudolf; Vollenweider, Max; and Sonderegger, Hans-Conrad, 4,314,481, Cl. 73-774.000.
Derrien, Jean-Yves; and Seigneurin, Laurent, to Rhone-Poulenc Industries. Catalyst for removing $NO_x$ from gas streams. 4,314,913, Cl. 252-464.000.
DesChamps Laboratories, Inc.: *See—*
DesChamps, Nicholas H., 4,314,607, Cl. 165-166.000.
DesChamps, Nicholas H., to DesChamps Laboratories, Inc. Plate type heat exchanger. 4,314,607, Cl. 165-166.000.
DeTolla, Francis L.; and Chaplin, Gary F., to United Technologies Corporation. Temperature actuated turbine seal. 4,314,793, Cl. 415-135.000.
de Vries, Paul. Electric keyboard musical instrument. 4,314,494, Cl. 84-1.060.
De Woskin, Kenneth J., to Beltx Corporation. Identification bands and methods of and apparatus for making them. 4,314,415, Cl. 40-21.00C.
Diagnostic Information, Inc.: *See—*
Merritt, Elisha B., 4,315,183, Cl. 313-94.000.
Dias, Francisco J.: *See—*
Luhleich, Hartmut; and Dias, Francisco J., 4,314,599, Cl. 164-16.000.
Dickinson, Robert J.; and Wagner, James L. Fishing device. 4,314,420, Cl. 43-42.390.
Diebold, Incorporated: *See—*
Graef, Harry T., 4,314,696, Cl. 271-275.000.
Diehl, David A.: *See—*
Chang, Wen-Hsuan; Piccirilli, Robert; and Diehl, David A., 4,314,923, Cl. 260-29.40R.
Digital Equipment Corporation: *See—*
Bernett, Frank W.; and Svendsen, Peter R., 4,315,288, Cl. 360-98.000.
Findeisen, Heinz H., 4,315,220, Cl. 328-150.000.
Dillard, David A.; Maguire, Eileen; and Donovan, Lawrence P., to Crown City Plating Co. Conditioning of polyamides for electroless plating. 4,315,045, Cl. 427-307.000.
Dinkhauser, Guenter: *See—*
Hohenschutz, Heinz; Gnad, Josef; Dinkhauser, Guenter; and Schaefer, Eberhard, 4,314,947, Cl. 260-410.000.
Dionex Corporation: *See—*
Rich, William E., Jr.; Smith, Frank C.; and McNeill, Janet L., 4,314,823, Cl. 23-230.00R.
Diversey Corporation, The: *See—*
Kremer, Lawrence N.; and Boehmer, Matthew A., 4,314,876, Cl. 156-664.000.
Dobbelstein, Arnold: *See—*
Poth, Ulrich; Moller, Dieter; and Dobbelstein, Arnold, 4,315,053, Cl. 428-423.700.
Dr. C. Otto & Comp. GmbH: *See—*
Kwasnik, Hans-Jurgen; and Piduch, Hans-Gunter, 4,314,787, Cl. 414-163.000.
Kwasnik, Hans-Jurgen; and Piduch, Hans-Gunter, 4,314,889, Cl. 202-241.000.
Dr. Ing. Rudolf Hell GmbH: *See—*
Block, Dieter; Gesell, Reinhard; and Peters, Hans-Werner, 4,315,136, Cl. 219-216.000.
Sommer, Ruediger; and Wischer, Hermann, 4,315,285, Cl. 358-280.000.
Doerr, Richard D., to ACF Industries, Inc. Reversible d.c. motor with over-drive prevention switches. 4,315,174, Cl. 310-68.00B.
Doi, Masafumi: *See—*
Sumitomo, Hiroyuki; Doi, Masafumi; Kobayashi, Kazuyuki; Fukami, Katsutoshi; and Kawanishi, Kenzo, 4,314,605, Cl. 165-110.000.
Dolejsi, Ivan; and Spur, Miloslav, to Polytechna, podnik zahranicniho obchodu pro zprostredkovani technicke spoluprace. Method for checking the intensity of destruction of malignant cells in the human body. 4,314,822, Cl. 23-230.00B.
Dolinar, Kevin O.: *See—*
Lipsitz, Barry R.; and Dolinar, Kevin O., 4,314,423, Cl. 46-232.000.
Dombrowski, Jerome P.: *See—*
Mulkins, George F.; Dombrowski, Jerome P.; and Isliker, Gaston R., 4,315,298, Cl. 361-253.000.
Dome Petroleum Limited: *See—*
Palmer, Harry E.; Stenning, David G. C.; and Crockett, Ray K., 4,314,776, Cl. 405-205.000.
Donaldson Company, Inc.: *See—*
Fox, Michael E., 4,314,832, Cl. 55-482.000.
Donovan, Lawrence P.: *See—*
Dillard, David A.; Maguire, Eileen; and Donovan, Lawrence P., 4,315,045, Cl. 427-307.000.
Donovan, William F.: *See—*
Jeter, Thomas R.; and Donovan, William F., 4,314,510, Cl. 102-523.000.
Dorr-Oliver Incorporated: *See—*
Kwon, Henry S. C.; and Jukkola, Walfred W., 4,314,967, Cl. 422-49.000.
Doryokuro Kakunenryo Kaihatsu Jigyodan: *See—*
Nakane, Ryohei; Isomura, Shohei; and Shimizu, Masami, 4,314,972, Cl. 422-191.000.
Doub, Leonard: *See—*
Mich, Thomas F.; and Doub, Leonard, 4,315,014, Cl. 424-263.000.
Dougherty, John J.; Rabinowitz, Mario; and Bahder, George, to Electric Power Research Institute, Inc. Insulative spacer for a low temperature coaxial cable and coaxial cable including the same. 4,315,098, Cl. 174-15.00S.
Dow Chemical Company, The: *See—*
Berazosky, Sandra; and Smith, Harry A., 4,314,925, Cl. 260-33.20R.
Lowery, Kirby, Jr.; Knight, George W.; and May, James A., Jr., 4,314,912, Cl. 252-429.00B.
Wang, Samuel S. M., 4,315,010, Cl. 424-260.000.
Dow Corning Corporation: *See—*
Baney, Ronald H.; and Gaul, John H., Jr., 4,314,956, Cl. 264-65.000.
Downing, James H.; Wells, James E., III; and Ioannou, Tom K., to Union Carbide Corporation. Preparation of reaction mass for the production of methylchlorosilane. 4,314,908, Cl. 252-182.000.
Dragerwerk Aktiengesellschaft: *See—*
Albarda, Scato, 4,314,564, Cl. 128-719.000.
Dresser Industries, Inc.: *See—*
McPhee, William A.; and Golian, Timothy G., 4,314,614, Cl. 175-4.560.
Randall, Russel R., 4,315,148, Cl. 250-262.000.
Drexler, Ferenc: *See—*
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; and Drexler, Ferenc, 4,314,939, Cl. 260-239.30P.
Drori, Mordeki. Combined pressure-regulator and manual shut-off valve. 4,314,582, Cl. 137-495.000.
Duchesne, Claude: *See—*
Gazard, Maryse; Eranian, Armand; Barre, Francoise; and Duchesne, Claude, 4,315,067, Cl. 430-296.000.
Ducol, Jean-Paul; Mesny, Jacques; and Warret, Julien, to Institut Textile de France; and Agence Nationale de Valorisation de la Recherche (ANVAR). Method and apparatus for guiding a flexible tube between annular and flattened cross section. 4,314,462, Cl. 66-152.000.
Duguet, Pierre; and Robert, Christian, to Automobiles Peugeot; and Societe Anonyme Automobiles Citroen. Automobile vehicle seat structure provided with a device for hooking safety belts. 4,314,715, Cl. 280-801.000.
DuHamel, Raymond H. Circularly polarized antenna with circular arrays of slanted dipoles mounted around a conductive mast. 4,315,264, Cl. 343-797.000.
Dunbar, Frank C.: *See—*
Pierson, Marvin B.; and Dunbar, Frank C., 4,315,056, Cl. 428-645.000.
Dunn, Howard E.; and Koch, Robert L., II, to George Koch Sons, Inc. Water purification by chlorinating, holding, and aerating. 4,314,906, Cl. 210-754.000.
Du Pont de Nemours, E. I., and Company: *See—*
Boeckel, John W.; Rohde, Vernon C.; and Wells, John R., 4,314,523, Cl. 118-50.000.
Mahoney, John J., Jr., 4,314,929, Cl. 260-42.150.
Duracell International Inc.: *See—*
Clarizio, Donald M., 4,315,062, Cl. 429-246.000.
Dussourd d'Hinterland, Lucien; and Normier, Gerard, to Pierre Fabre S.A. Process for obtaining a plasminogen activator. 4,314,994, Cl. 424-95.000.
Dye, John A.; and Weber, Peter E., to United Technologies Corporation. High performance cooled laser mirror. 4,314,742, Cl. 350-310.000.
Dylag, Kenneth C. Card counting prevention apparatus for blackjack. 4,314,700, Cl. 273-148.00R.
E M I Limited: *See—*
Clow, Hugh; and Walters, Peter E., 4,315,216, Cl. 324-309.000.
Easthope, Thomas C.; and Martin, Robert R. Method of meat tenderizing. 4,314,386, Cl. 17-51.000.
Eastman Kodak Company: *See—*
Harvey, Donald M., 4,314,751, Cl. 354-212.000.
Tyan, Yuan-Sheng; and Perez-Albuerne, Evelio A., 4,315,096, Cl. 136-244.000.
Eberbach, Steven J. Speaker cross-over networks. 4,315,102, Cl. 179-1.00D.
Eberspacher, J.: *See—*
Gerwin, Reinhard, 4,314,797, Cl. 417-491.000.

Eckert, Konrad: *See*—
Holzbaur, Siegfried; and Eckert, Konrad, 4,314,951, Cl. 261-44.00D.
Edwards, Gerald T.; and Schluderberg, Donald C., to Babcock & Wilcox Company, The. Industrial technique. 4,314,885, Cl. 376-327.000.
Een-Holmgren Ortopediska AB: *See*—
Pettersson, Torsten L. E., 4,314,398, Cl. 29-407.000.
Egami, Kazuhito: *See*—
Ban, Itsuki; Shiraki, Manabu; and Egami, Kazuhito, 4,315,177, Cl. 310-154.000.
Ban, Itsuki; Shiraki, Manabu; and Egami, Kazuhito, 4,315,178, Cl. 310-154.000.
Eldorado Nuclear Limited: *See*—
Zawidzki, Tadeusz W., 4,314,952, Cl. 264-0.500.
Electric Power Research Institute, Inc.: *See*—
Dougherty, John J.; Rabinowitz, Mario; and Bahder, George, 4,315,098, Cl. 174-15.00S.
Electricity Council, The: *See*—
Townend, Rodney; Wareing, Joseph B.; and Winstanley, Raymond, 4,315,131, Cl. 219-121.0EB.
Electronic Devices Incorporated: *See*—
Schumacher, Peter M., 4,315,282, Cl. 358-107.000.
Ellis, Haynes, Jr.: *See*—
United States of America, National Aeronautics and Space Administration; and Ellis, Haynes, Jr., 4,315,266, Cl. 343-895.000.
Elmore, Ernest L.: *See*—
Mills, Edwin R.; and Elmore, Ernest L., 4,315,141, Cl. 219-505.000.
Elmore, Jimmy D.; and Cecil, Joseph L., to Celanese Corporation. Stable aqueous epoxy dispersions. 4,315,044, Cl. 427-386.000.
Elter, Claus: *See*—
Fritz, Rolf; Schoening, Josef; Elter, Claus; and Theymann, Walter, 4,314,883, Cl. 376-381.000.
Endou, Nobuhiro: *See*—
Kokubu, Sadao; and Endou, Nobuhiro, 4,315,117, Cl. 200-61.270.
Energy Optics, Inc.: *See*—
Ward, Steven M., 4,315,248, Cl. 340-825.720.
Engdahl, Gerald E., to Chicago Bridge & Iron Company. Freeze concentration apparatus and process. 4,314,455, Cl. 62-124.000.
Engelhard Minerals & Chemicals Corporation: *See*—
Washabaugh, Frank J.; and Goble, William C., 4,314,919, Cl. 260-22.0CB.
Epstein, Harry, to Kastar, Inc. Automobile fuse puller and combination circuit tester. 4,314,383, Cl. 7-170.000.
Eranian, Armand: *See*—
Gazard, Maryse; Eranian, Armand; Barre, Francoise; and Duchesne, Claude, 4,315,067, Cl. 430-296.000.
Erbse, Dietmark: *See*—
Queiser, Horst; Meichsner, Othmar; and Erbse, Dietmark, 4,314,877, Cl. 159-47.0WL.
Errichiello, Dominic R. Book binders with tabs. 4,314,716, Cl. 281-29.000.
Eskew, Walter H.: *See*—
Harris, Jack W.; and Eskew, Walter H., 4,314,647, Cl. 211-121.000.
Essilor International, Cie Generale d'Optique: *See*—
Deroode, Jean R., 4,314,814, Cl. 8-471.000.
Essilor International (Compagnie Generale d'Optique): *See*—
Lapeyre, Guy; and Thiebaut, Jean, 4,314,766, Cl. 366-101.000.
Ethyl Corporation: *See*—
Wollensak, John C.; and Ihrman, Kryn G., 4,314,962, Cl. 264-328.600.
Etienne, Claude; Fardouet, Claude; and Mercier L'Abbe, Guy, to Commissariat a L'Energie Atomique. Device for actuating a nuclear reactor control rod. 4,314,882, Cl. 376-235.000.
Etzel, James E.; and Wachinski, Anthony M., to Purdue Research Foundation. Columnar fine mesh magnetized ion exchange resin system. 4,314,905, Cl. 210-670.000.
Eudeline, Jean-Paul: *See*—
Defretin, Francis; Eudeline, Jean-Paul; Schoch, Elisabeth; and Voisin, Alain, 4,314,907, Cl. 252-22.000.
Eventoff, Franklin N. Bounceless switch apparatus. 4,315,238, Cl. 338-99.000.
EVG Entwicklungs- u. Verwertungs-Gesellschaft m.b.H.: *See*—
Schmidt, Gerhard; Ritter, Klaus; and Ritter, Gerhard, 4,315,125, Cl. 219-56.000.
Exxon Research & Engineering Co.: *See*—
Ryan, Douglas G., 4,314,886, Cl. 196-14.500.
Ezekiel, Shaoul; Leiby, Clare C.; Picard, Richard H.; Willis, Charles R.; and Hackel, Richard P., to United States of America, Air Force. Laser stimulated Raman molecular beam time and frequency standard. 4,315,224, Cl. 331-3.000.
F.I.A.M.M. S.p.A. Fabbrica Italiana Accumulatori Motocarri Montecchio: *See*—
Frigo, Domenico, 4,314,522, Cl. 116-142.00R.
Faber, Paul V.: *See*—
Corbman, Philip; and Faber, Paul V., 4,314,888, Cl. 202-143.000.
Fabio, James L.: *See*—
Parnell, Lyle J.; and Fabio, James L., 4,314,783, Cl. 410-34.000.
Fahmy, Mohamed A. H.; Fukuto, Tetsuo R.; and Jojima, Teruomi, to University of California, The Regents of the. Alkylpolyoxysulfinyl and alkylpolythiosulfinyl derivatives of carbamate esters. 4,315,026, Cl. 424-282.000.
Fahmy, Mohamed A. H.; and Fukuto, Tetsuo R., to University of California, The Regents of the. Pesticidal symmetrical and asymmetrical sulfinyldicarbamates containing a heterocyclic group. 4,315,027, Cl. 424-282.000.
Faiks, Frederick S., to Steelcase Inc. Chair control. 4,314,728, Cl. 297-300.000.
Fajans, Jack. Three-dimensional display device. 4,315,281, Cl. 358-88.000.
Falconer Security Printers: *See*—
Fraser, Robert; Rouse, John; Redic, Robert C.; and Frock, Suzanne, 4,314,635, Cl. 206-232.000.
Fanning, Alan W.; Jameson, William G., Jr.; and Hazel, Victor E., to General Electric Company. Nuclear fuel assembly. 4,314,884, Cl. 376-441.000.
Fansteel Inc.: *See*—
McCormick, Jon, 4,314,863, Cl. 148-37.000.
Fardouet, Claude: *See*—
Etienne, Claude; Fardouet, Claude; and Mercier L'Abbe, Guy, 4,314,882, Cl. 376-235.000.
Farina, Peter R.; and Grattan, James A., to Baker Instruments Corp. Folic acid derivatives and process for preparation. 4,314,988, Cl. 424-1.000.
Farr, Glyn P. R., to Girling Limited. Control valve assembly. 4,314,731, Cl. 303-24.00A.
Farrington, Albert J. Core building system. 4,314,430, Cl. 52-206.000.
Fauchier, Jess F., II: *See*—
Anderson, Richard D.; Fauchier, Jess F., II; and Laciak, Francis M., 4,314,757, Cl. 355-29.000.
Fedde, Paul A.; Ghosh, Sambhunath; Henry, Michael P.; and Klass, Donald L., to Transagra Corporation. Anaerobic digestion of waste and biomass by use of lactobacillus culture additives. 4,314,904, Cl. 210-611.000.
Federal Paper Board Company, Inc.: *See*—
Manizza, Guelfo A., 4,314,640, Cl. 206-434.000.
Feenstra, Johannes; Klop, Marius A. F.; Meerman, Wilhelmus C. P. M.; Peelen, Jan G. J.; and Tuin, Hermanus N., to U.S. Philips Corporation. Coating apparatus for manufacturing optical fibers. 4,314,834, Cl. 65-11.100.
Feess, Erich; and Reinhardt, Friedrich, to Hoechst Aktiengesellschaft. Two-phase printing process for preparing conversion articles and discharge resist prints. 4,314,811, Cl. 8-457.000.
Feess, Erich, to Hoechst Aktiengesellschaft. Two-phase printing process for preparing conversion articles and discharge resist prints. 4,314,812, Cl. 8-457.000.
Feldman, Morris: *See*—
Anderson, Blair V.; Feldman, Morris; and Jacoby, Richard, 4,314,412, Cl. 36-100.000.
Felix, Raymond A., to Stauffer Chemical Company. Biocidal thiadiazolylmercapto-substituted haloacrylonitrile compounds. 4,314,838, Cl. 71-67.000.
Feller, Otto; Kuhl, Manfred; and Oepen, Heinz. Apparatus for the out-of-round machining of workpieces. 4,314,492, Cl. 82-18.000.
Fennekels, Peter; and Waltmann, Ernst, to Girmes-Werke AG. Process for washing dyed or printed textile material. 4,314,804, Cl. 8-137.000.
Ferguson, Frank T., to Control Technology, Incorporated. Reserve power supply for computers. 4,315,162, Cl. 307-66.000.
Ferla, Giuseppe: *See*—
Daniele, Vincenzo; Corda, Giuseppe; Ravaglia, Andrea; and Ferla, Giuseppe, 4,315,239, Cl. 338-308.000.
Ferrary, Jean-Paul. Method for the manufacture of a cycle or autocycle wheel rim. 4,314,964, Cl. 264-501.000.
Feuerherd, Karl-Heinz: *See*—
Koenig, Karl-Heinz; Feuerherd, Karl-Heinz; and Oeser, Heinz-Guenter, 4,314,948, Cl. 260-453.00P.
Fickers, Gisela, to Asten Group, Incorporated. Stitchless low bulk, pin-type seam for use in paper making equipment fabrics, such as dryer felts. 4,315,049, Cl. 428-104.000.
Fieldcrest Mills, Inc.: *See*—
Mills, Edwin R.; and Elmore, Ernest L., 4,315,141, Cl. 219-505.000.
Findeisen, Heinz H., to Digital Equipment Corporation. Peak detector circuit. 4,315,220, Cl. 328-150.000.
Fink, Gary: *See*—
Macleod, Kenneth S.; and Fink, Gary, 4,314,958, Cl. 264-167.000.
Fink, Leon: *See*—
Saint Marcoux, Roland; and Fink, Leon, 4,315,299, Cl. 361-274.000.
Firestone Tire & Rubber Company, The: *See*—
Loeffler, Earl F.; and Weyand, Harley P., Jr., 4,314,864, Cl. 156-111.000.
Fish, Aaron M.; Schlessel, Joseph H.; and Minski, Seymour B., to Unican Security Systems Corporation. Tubular key duplicating machine. 4,314,780, Cl. 409-81.000.
Fisher, Robert J.; and Lefever, Lawrence R., to Harman International Industries, Inc. Actuator switch for remote control rearview mirrors. 4,315,113, Cl. 200-5.00R.
Fitzgerald, Maurice J., to Polaroid Corporation. Polystyryl amine polymeric binders for photographic emulsions. 4,315,071, Cl. 430-627.000.
Flamm, Daniel L., to Bell Telephone Laboratories, Incorporated. Device fabrication by plasma etching. 4,314,875, Cl. 156-643.000.
Fleischer, Paul E.; and Laker, Kenneth R., to Bell Telephone Laboratories, Incorporated. Generalized switched-capacitor active filter. 4,315,227, Cl. 333-173.000.
Flo-Con Systems, Inc.: *See*—
Shapland, Earl P., 4,314,659, Cl. 222-590.000.
FMC Corporation: *See*—
Beacham, Harry H.; and Norris, Robert D., 4,315,082, Cl. 525-20.000.
Fogleman, Boyd C. Cattle stanchion having a simplified self-locking mechanism. 4,314,528, Cl. 119-147.00R.

Folkman, Bern D., to Tronomed International, Inc. Disposable valve. 4,314,586, Cl. 137-625.470.
Forbes, Bert E.: *See—*
Bayliss, John A.; Cox, George W.; Forbes, Bert E.; and Kahn, Kevin C., 4,315,310, Cl. 364-200.000.
Forbes, Hampton E., Jr., to Westvaco Corporation. Flip top carton. 4,314,643, Cl. 206-626.000.
Ford Aerospace & Communications Corp.: *See—*
Reisman, Elias; Goodsell, David S.; and Masino, Fred S., 4,314,449, Cl. 62-3.000.
Ford Motor Company: *See—*
Lauven, Walter, 4,314,488, Cl. 74-869.000.
Forestier, Serge: *See—*
Jacquet, Bernard; Lang, Gerard; and Forestier, Serge, 4,314,808, Cl. 8-405.000.
Foss, Richard J.: *See—*
Schwendener, Derek K.; Ainsworth, Neil L.; and Foss, Richard J., 4,315,058, Cl. 429-84.000.
Foster, Dale: *See—*
Fullenkamp, Eugene; and Foster, Dale, 4,314,735, Cl. 339-45.00R.
Fourcadier, Chantal; and Grollier, Jean F., to L'Oreal. Compositions suitable for use in dyeing hair obtained from the reaction of a polyhydroxybenzene and an oxidative dyestuff precursor of the para type. 4,314,810, Cl. 8-410.000.
Fowler, James E.: *See—*
Spaziani, Frederick F.; and Fowler, James E., 4,314,895, Cl. 204-195.00M.
Fox, Michael E., to Donaldson Company, Inc. Air cleaner with cartridge suspension. 4,314,832, Cl. 55-482.000.
Fox, Sidney W.; and Holden, Arthur I., to Polymicro. Artificial gelatins of high methionine content for photographic film. 4,315,072, Cl. 430-628.000.
Frambach, Henry R.: *See—*
Gordon, Stanley J.; and Frambach, Henry R., 4,314,424, Cl. 49-400.000.
Franke, Kurt, to Siemens Aktiengesellschaft. X-ray diagnostic generator with a mAs-relay. 4,315,155, Cl. 250-409.000.
Franklin, John C., to Texasgulf Inc. Increased production of wet process phosphoric acid by gelatin addition. 4,314,978, Cl. 423-320.000.
Fraser, Robert; Rouse, John; Redic, Robert C.; and Frock, Suzanne, to Falconer Security Printers. Checking account check and check book order-taking portfolio. 4,314,635, Cl. 206-232.000.
Frederick, Larry D.; and Somers, Richard E., to Solar Unlimited, Inc. Knock-down heat storage tank. 4,314,602, Cl. 165-10.000.
Freiberg, Gunter, to Agfa-Gevaert AG. Microfilm reading device. 4,314,745, Cl. 353-101.000.
Friend, Jack W. Smoothing and cleaning of molded ceramics. 4,314,426, Cl. 51-393.000.
Frigo, Domenico, to F.I.A.M.M. S.p.A. Fabbrica Italiana Accumulatori Motocarri Montecchio. Acoustic electropneumatic signal generator, particularly for automotive vehicles. 4,314,522, Cl. 116-142.00R.
Fritz, Rolf; Schoening, Josef; Elter, Claus; and Theymann, Walter, to Hochtemperatur-Reaktorbau GmbH. Graphite block having wear zone and load bearing zone for side reflector of high temperature reactor. 4,314,883, Cl. 376-381.000.
Frock, Suzanne: *See—*
Fraser, Robert; Rouse, John; Redic, Robert C.; and Frock, Suzanne, 4,314,635, Cl. 206-232.000.
Frye, Robert B., to General Electric Company. Process for securing primerless adhesion of silicone resin coating composition to cast acrylics. 4,315,046, Cl. 427-322.000.
Ftalital Prodotti Chimici Speciali S.p.A.: *See—*
Neri, Amleto; and Sanchioni, Sergio, 4,314,946, Cl. 260-346.760.
Fuchs, Rudolf, to Sulzer Brothers Limited. Jacquard attachment for warp knitting machines. 4,314,463, Cl. 66-203.000.
Fuji Photo Film Co., Ltd.: *See—*
Kato, Hisatoyo; Ishida, Masamitsu; and Matsumoto, Seiji, 4,315,318, Cl. 364-515.000.
Fujimoto, Ted T.: *See—*
Swithenbank, Colin; and Fujimoto, Ted T., 4,314,844, Cl. 71-92.000.
Fujita, Teizo; and Kimura, Haruo, to Izumi Denki Corporation. Switching apparatus assembly structure. 4,315,123, Cl. 200-307.000.
Fujita, Yoshiji: *See—*
Mori, Fumio; Omura, Yoshiaki; Fujita, Yoshiji; Nishida, Takashi; Hosogai, Takeo; Wada, Fumio; Aihara, Sukeji; Tamai, Yoshin; and Itoi, Kazuo, 4,315,029, Cl. 424-304.000.
Fujitsu Ltd.: *See—*
Tokunaga, Michio; Okada, Ryoichi; Mizutani, Hideo; Hasegawa, Koichi; and Osaki, Takaaki, 4,315,206, Cl. 323-265.000.
Wakatsuki, Noboru; and Masaaki, Ono, 4,314,393, Cl. 29-25.350.
Fukami, Katsutoshi: *See—*
Sumitomo, Hiroyuki; Doi, Masafumi; Kobayashi, Kazuyuki; Fukami, Katsutoshi; and Kawanishi, Kenzo, 4,314,605, Cl. 165-110.000.
Fukuda, Tadaji; and Misumi, Teruo, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member having a halogen containing charge injection layer. 4,315,063, Cl. 430-65.000.
Fukuda, Tetsuro; Matsuura, Hideo; Koizumi, Yoshihito; and Yamaguchi, Takeshi, to Riken Vitamine Oil Co., Ltd. Emulsifier composition and quality improvement method for starch containing food. 4,315,041, Cl. 426-653.000.
Fukui, Hiroshi; and Kimura, Shin, to Hitachi, Ltd. Thyristor with switchable capacitor between auxiliary thyristor cathode and main thyristor gate regions. 4,315,274, Cl. 357-38.000.
Fukushima, Toshihiko: *See—*
Kamejima, Kohji; Kano, Minoru; Tanaka, Hideki; and Fukushima, Toshihiko, 4,314,454, Cl. 62-98.000.
Fukuto, Tetsuo R.: *See—*
Fahmy, Mohamed A. H.; Fukuto, Tetsuo R.; and Jojima, Teruomi, 4,315,026, Cl. 424-282.000.
Fahmy, Mohamed A. H.; and Fukuto, Tetsuo R., 4,315,027, Cl. 424-282.000.
Fullenkamp, Eugene; and Foster, Dale, to Hill-Rom Company, Inc. Bed locator having an integral electric socket and a plug ejector. 4,314,735, Cl. 339-45.00R.
Fuller Company: *See—*
Sareen, Bal K., 4,314,677, Cl. 241-176.000.
Funakoshi, Satoshi: *See—*
Uemura, Yahiro; Arimura, Hirofumi; Morise, Hiroshi; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,314,935, Cl. 260-112.00R.
Furbee, Avery D., to Picker Corporation. Frosted X-ray tube. 4,315,182, Cl. 313-59.000.
Furuhashi, Shoji: *See—*
Asano, Masaharu; Tamura, Hideyuki; and Furuhashi, Shoji, 4,314,537, Cl. 123-440.000.
Furuichi, Junji: *See—*
Ito, Yoshinori; Ikeda, Masahiko; and Furuichi, Junji, 4,315,127, Cl. 219-73.100.
Furuse, Masayasu: *See—*
Miyata, Teruo; Akiyama, Taichiro; and Furuse, Masayasu, 4,314,380, Cl. 3-1.900.
G. M. Sommer Company, Inc.: *See—*
Sommer, Gordon M., 4,314,626, Cl. 192-0.02R.
Gaborieau, Jean-Yves: *See—*
Baril, Jacques; and Gaborieau, Jean-Yves, 4,314,468, Cl. 72-57.000.
Gabriel, Edwin Z. Educational analog computer laboratory. 4,315,320, Cl. 364-808.000.
GAF Corporation: *See—*
Ozari, Yehuda; and Barabas, Eugene S., 4,315,085, Cl. 525-301.000.
Gagliani, John; and Lee, Raymond, to International Harvester Company. Polyimides. 4,315,076, Cl. 521-77.000.
Gagliani, John; and Lee, Raymond, to International Harvester Company. Polyimides. 4,315,077, Cl. 521-77.000.
Gagliani, John; and Lee, Raymond, to International Harvester Company. Polyimides. 4,315,080, Cl. 521-189.000.
Gaiser, William R.; Crutchfield, E. Bryant; and Bartley, Harold D., to Mead Corporation, The. Flexible plastic closure mechanism and container. 4,314,651, Cl. 220-326.000.
Gamoh, Ryouji, to Tokyo Shibaura Denki Kabushiki Kaisha. Electronic watthour meter. 4,315,212, Cl. 324-142.000.
Gardner, Esther C., to Toyad Corporation. Methods of reducing smoke evolution from burning neoprene foam and neoprene foam products produced thereby. 4,315,075, Cl. 521-71.000.
Gardner, Hugh C., to Union Carbide Corporation. Composition containing a half ester of an organic polyol, an unsaturated monomer, an epoxide, and reinforcing fiber. 4,314,930, Cl. 260-42.180.
Gariglio, Ezio V.: *See—*
Saurin, Emmanuel E. V. V.; and Gariglio, Ezio V., 4,315,132, Cl. 219-121.0LD.
Gasson, Brian C., to Beecham Group Limited. Aminocarbonylmethyl ethers of clavulanic acid, a process for their preparation and use. 4,314,941, Cl. 260-245.300.
Gaubert, Rene J. Bulk liquid container having a pivotable tap. 4,314,654, Cl. 222-83.000.
Gauer, Richard: *See—*
Muller, Walter; Gauer, Richard; Walkenhorst, Wilfried; and Wild, Gerhard, 4,314,606, Cl. 165-163.000.
Gaul, John H., Jr.: *See—*
Baney, Ronald H.; and Gaul, John H., Jr., 4,314,956, Cl. 264-65.000.
Gazard, Maryse; Eranian, Armand; Barre, Francoise; and Duchesne, Claude, to Thomson-CSF. Method for making electron sensitive negative resist. 4,315,067, Cl. 430-296.000.
Gema AG: *See—*
Moos, Kurt, 4,314,669, Cl. 239-1.000.
General Atomic Company: *See—*
Norman, John H.; and Williamson, David G., 4,314,982, Cl. 423-539.000.
General Dynamics Corporation: *See—*
Slysh, Paul, 4,314,636, Cl. 206-321.000.
General Electric Company: *See—*
Cooper, Glenn D.; Lee, Gim F., Jr.; and Shufelt, Rainey A., 4,315,084, Cl. 525-69.000.
Fanning, Alan W.; Jameson, William G., Jr.; and Hazel, Victor E., 4,314,884, Cl. 376-441.000.
Frye, Robert B., 4,315,046, Cl. 427-322.000.
Hamilton, William C.; Moffatt, William G.; and Pagnotta, Gasper, 4,315,175, Cl. 310-71.000.
Kirkpatrick, Robert G.; and Snyder, Ronald R., 4,314,501, Cl. 89-12.000.
Kutney, John T., 4,314,681, Cl. 244-54.000.
Robinson, Paul B.; Ouellette, Maurice J.; and Schmidt, Larry A., 4,315,251, Cl. 340-310.00A.
Wolfrey, Austin A., 4,314,917, Cl. 260-18.0EP.
Wyler, John S., 4,314,483, Cl. 73-861.350.
General Motors Corporation: *See—*
Skiven, David A.; Sortor, Charles J.; and Tessier, Raymond J., 4,314,830, Cl. 55-217.000.
George Koch Sons, Inc.: *See—*
Dunn, Howard E.; and Koch, Robert L., II, 4,314,906, Cl. 210-754.000.

Gerardot, Claude; and Romero, Georges, to Commissariat a l'Energie Atomique. Flexible transmission line for a fluid and for electric signals. 4,315,099, Cl. 174-47.000.

Gerasimova, Lidia G.: *See—*
Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Belokoskov, Valentin I.; and Plotnikov, Vladimir P., 4,314,975, Cl. 423-81.000.

Gerhard, Thomas; and Giesen, Ulrich, to Waggonfabrik Uerdingen AG. Damped suspension system for conveyors. 4,314,512, Cl. 105-149.000.

Germanton, Charles E. Security systems employing an electronic lock and key apparatus. 4,315,247, Cl. 235-382.000.

Gertisser, Berthold, to Sandoz Ltd. Monoazo compounds having a substituted thiazolium-5 diazo component radical and a substituted 1,4-phenylene coupling component radical. 4,314,817, Cl. 8-539.000.

Gertsch, Ernst: *See—*
Gertsch, Ulrich, 4,314,714, Cl. 280-630.000.

Gertsch, Ulrich, to Gertsch, Ulrich; and Gertsch, Ernst. Safety ski binding. 4,314,714, Cl. 280-630.000.

Gerwin, Reinhard, to Eberspacher, J. Metering piston pump. 4,314,797, Cl. 417-491.000.

Gesell, Reinhard: *See—*
Block, Dieter; Gesell, Reinhard; and Peters, Hans-Werner, 4,315,136, Cl. 219-216.000.

Ghosh, Sambhunath: *See—*
Fedde, Paul A.; Ghosh, Sambhunath; Henry, Michael P.; and Klass, Donald L., 4,314,904, Cl. 210-611.000.

Giacchetti, Anacleto D. Amplified radiation igniter system and method for igniting fuel in an internal combustion engine. 4,314,530, Cl. 123-143.00R.

Giannini, Umberto; Longi, Paolo; Deluca, Domenico; and Pricca, Angelo, to Montecatini Edison S.p.A. Polymerization catalyst. 4,314,911, Cl. 252-429.00A.

Gibson, Colin E.: *See—*
Reynolds, John M.; Gibson, Colin E.; Seamans, John S.; and van der Steen, Anton R. F., 4,314,414, Cl. 37-54.000.

Gibson, Walter G.; and Wagner, Theodor M., to RCA Corporation. Non-linear aperture correction circuit having a signal bypass arrangement. 4,315,277, Cl. 358-8.000.

Giebler, Martin M.: *See—*
Palmer, William B.; and Giebler, Martin M., 4,315,265, Cl. 343-840.000.

Giesen, Ulrich: *See—*
Gerhard, Thomas; and Giesen, Ulrich, 4,314,512, Cl. 105-149.000.

Ginsburg, Milton; and Lux, William J., to Ginsburg, Milton. Hinge for toilet seat and lid. 4,314,382, Cl. 4-236.000.

Girling Limited: *See—*
Farr, Glyn P. R., 4,314,731, Cl. 303-24.00A.

Girmes-Werke AG: *See—*
Fennekels, Peter; and Waltmann, Ernst, 4,314,804, Cl. 8-137.000.

Giuffre, Anthony A.; and Giuffre, Anthony F. Heat exchange system for recycling waste heat. 4,314,601, Cl. 165-1.000.

Giuffre, Anthony F.: *See—*
Giuffre, Anthony A.; and Giuffre, Anthony F., 4,314,601, Cl. 165-1.000.

GKN Floform Limited: *See—*
Waite, John S., 4,314,392, Cl. 29-25.120.

Glaxo Group Limited: *See—*
Ayres, Barry E.; and Weir, Niall G., 4,315,005, Cl. 424-246.000.
Storer, Richard, 4,315,006, Cl. 424-250.000.

Globig, Manfred, to Concordia Sprecher Schaltgerate GmbH. Load disconnection switch. 4,315,120, Cl. 200-146.00R.

Gloyer, Wolfgang. Folding box carrying container with adhesive seal for carrying standing bottles. 4,314,639, Cl. 206-427.000.

Gnad, Josef: *See—*
Hohenschutz, Heinz; Gnad, Josef; Dinkhauser, Guenter; and Schaefer, Eberhard, 4,314,947, Cl. 260-410.000.

Goble, William C.: *See—*
Washabaugh, Frank J.; and Goble, William C., 4,314,919, Cl. 260-22.0CB.

Godneva, Maria M.: *See—*
Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Belokoskov, Valentin I.; and Plotnikov, Vladimir P., 4,314,975, Cl. 423-81.000.

Goebel, Franz; and McHugh, William T., to GTE Products Corporation. Metal substrate for an electrochemical cell. 4,315,060, Cl. 429-122.000.

Goglio, Luigi; and Bassetti, Aldo. Syrup feed system for drink distribution apparatus of the after-mixing type. 4,314,768, Cl. 366-156.000.

Golian, Timothy G.: *See—*
McPhee, William A.; and Golian, Timothy G., 4,314,614, Cl. 175-4.560.

Gollehon Industries, Inc.: *See—*
Gollehon, John T., 4,314,620, Cl. 181-144.000.

Gollehon, John T., to Gollehon Industries, Inc. Loudspeaker with cone driven horn. 4,314,620, Cl. 181-144.000.

Goodsell, David S.: *See—*
Reisman, Elias; Goodsell, David S.; and Masino, Fred S., 4,314,449, Cl. 62-3.000.

Goolsby, Patrick F.; and Swenck, George F., to Reynolds Metals Company. Method of making a solar heat exchanger. 4,314,397, Cl. 29-157.30R.

Gordon, Robert L.; and Wolak, Paul Z., to International Paper Company. Shipping container designed to prevent can damage due to chime ride. 4,314,638, Cl. 206-427.000.

Gordon, Stanley J.; and Frambach, Henry R. Thermal window construction. 4,314,424, Cl. 49-400.000.

Gossens, Peter: *See—*
Heinen, Peter; and Gossens, Peter, 4,314,391, Cl. 28-273.000.

Gotcher, Alan J.: *See—*
Middleman, Lee M.; and Gotcher, Alan J., 4,315,237, Cl. 338-22.00R.

Goto, Yasumasa; and Ozaki, Junichi, to Toshiba Corporation. Support structure for shadow mask of color cathode ray tube. 4,315,189, Cl. 313-405.000.

Gould Inc.: *See—*
Smith, Robert K., 4,315,121, Cl. 200-147.00R.
Zocholl, Stanley E., 4,315,295, Cl. 361-96.000.

Graef, Harry T., to Diebold, Incorporated. Paper currency transport construction. 4,314,696, Cl. 271-275.000.

Grafling, Joachim: *See—*
Kramer, Wilhelm; and Grafling, Joachim, 4,315,122, Cl. 200-248.000.

Gran, Staffan O. Wet treatment of textiles. 4,314,464, Cl. 68-178.000.

Granoff, Richard A.: *See—*
Stein, Bernard; and Granoff, Richard A., 4,314,970, Cl. 422-72.000.

Granstrom, Staffan; and Karlsson, Gosta, to ASEA Aktiebolag. Heating modules for billets in inductive heating furnaces. 4,315,124, Cl. 219-10.710.

Grattan, James A.: *See—*
Farina, Peter R.; and Grattan, James A., 4,314,988, Cl. 424-1.000.

Gray, Kenneth P., to Carrier Corporation. Refrigerant motor. 4,314,447, Cl. 60-671.000.

Graziano, Bruno R.: *See—*
Brickman, Norman F.; and Graziano, Bruno R., 4,315,330, Cl. 370-104.000.

Greatbatch, Wilson. Tissue growth control apparatus and method. 4,314,554, Cl. 128-207.210.

Greaves, Alan J.; Greenaway, Philip E.; and Nightingale, Charles, to Post Office, The. Bandstop filters. 4,315,229, Cl. 333-216.000.

Green Cross Corporation, The: *See—*
Uemura, Yahiro; Arimura, Hirofumi; Morise, Hiroshi; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,314,935, Cl. 260-112.00R.

Greenaway, Philip E.: *See—*
Greaves, Alan J.; Greenaway, Philip E.; and Nightingale, Charles, 4,315,229, Cl. 333-216.000.

Greenberg, Charles B.: *See—*
Breininger, J. Shannon; and Greenberg, Charles B., 4,315,055, Cl. 428-434.000.

Greenwood, Walter, Jr. Accumulating conveyor. 4,314,630, Cl. 198-718.000.

Gregor, Jiri: *See—*
Mlynarik, Jan; Novak, Josef; and Gregor, Jiri, 4,314,690, Cl. 254-29.00A.

Greif Bros. Corporation: *See—*
Santoni, Cesar, 4,314,720, Cl. 292-256.690.

Grenier, Georges: *See—*
Cerf, Olivier; Grenier, Georges; Hermier, Jean; and Rancurel, Alain, 4,314,965, Cl. 422-28.000.

Gresko, Laurence S., to United States of America, Air Force. Focused, single strand, optical fiber rotational alignment image-sensing and comparing system. 4,314,762, Cl. 356-150.000.

Griffin, Patrick O.: *See—*
Jimenez, Miguel A.; and Saucedo, Manuel M. (said Manuel M. Saucedo assors. to), 4,314,515, Cl. 111-77.000.

Griffith, James R.: *See—*
Keller, Teddy M.; and Griffith, James R., 4,315,093, Cl. 528-362.000.

Grollier, Jean F.: *See—*
Fourcadier, Chantal; and Grollier, Jean F., 4,314,810, Cl. 8-410.000.

Grollier, Jean-Francois; Monnais, Christian; and Peritz, Lyonnel, to L'Oreal. Hair dye composition containing a hair dye formulation packaged in two parts. 4,314,807, Cl. 8-406.000.

Grossman, Rodney, to Brock Manufacturing, Inc. Grain bin discharge guard. 4,314,675, Cl. 241-95.000.

Grottola, Oresto P. Dart game and board. 4,314,703, Cl. 273-408.000.

Grunert, Hans C., to Sybron Corporation. Cabinet drawer support. 4,314,734, Cl. 312-322.000.

GTE Automatic Electric Laboratories, Inc.: *See—*
Morgan, John H.; and Sutton, Larry W., 4,315,133, Cl. 219-121.0FS.

GTE Laboratories Incorporated: *See—*
Peters, Thomas E.; and McColl, James R., 4,315,190, Cl. 313-467.000.

GTE Products Corporation: *See—*
Armstrong, Donald E.; Sindlinger, Ronald E.; and Harvey, William J., 4,314,394, Cl. 29-25.160.
Goebel, Franz; and McHugh, William T., 4,315,060, Cl. 429-122.000.

Guigan, Jean. Simultaneous analysis apparatus. 4,314,968, Cl. 422-64.000.

Gulf Oil Corporation: *See—*
Hoffmann, Otto L.; and Patel, Natu R., 4,314,843, Cl. 71-92.000.

Gustav F. Gerdts KG: *See—*
Sieglita, Manfred, 4,314,584, Cl. 137-613.000.

Hackel, Richard P.: *See—*
Ezekiel, Shaoul; Leiby, Clare C.; Picard, Richard H.; Willis, Charles R.; and Hackel, Richard P., 4,315,224, Cl. 331-3.000.

Hackett, Charles D., to Combustion Engineering, Inc. Rib design for boiler tubes. 4,314,587, Cl. 138-38.000.
Hackman, Donald J.: *See*—
Thomas, David L.; and Hackman, Donald J., 4,314,612, Cl. 173-119.000.
Hade, Conrad; and Robinson, Dale D., to Dalcon Marketing Inc. Refrigerated display case. 4,314,458, Cl. 62-256.000.
Hagerman, Enoch R.; and Walkden, Richard H., to Uniment Systems, Inc. Frictional belt brake. 4,314,631, Cl. 198-856.000.
Haggerty, James S.: *See*—
Darringer, Richard E.; Scharf, Wayne L.; and Haggerty, James S., 4,315,150, Cl. 250-338.000.
Haley, Jack R.; Smith, Jimmy B.; and Mansfield, Vaughn, to Peabody Coal Company, Inc. Apparatus for producing coke from fine and coarse coal. 4,314,887, Cl. 202-91.000.
Hamilton, Clark A.: *See*—
Harris, Richard E.; and Hamilton, Clark A., 4,315,255, Cl. 340-347.0AD.
Hamilton, William C.; Moffatt, William G.; and Pagnotta, Gasper, to General Electric Company. Aluminum-to-copper transition member for aluminum wound motors and aluminum wound motor equipped with the same. 4,315,175, Cl. 310-71.000.
Hammann, Ingeborg: *See*—
Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, 4,315,008, Cl. 424-200.000.
Hanashima, Shuichi: *See*—
Kyomasu, Ryuichi; Hanashima, Shuichi; and Suzumura, Yoshikazu, 4,315,199, Cl. 318-601.000.
Hancock, Geoffrey, to Semco Instruments, Inc. Reliable over-temperature control circuit. 4,315,296, Cl. 361-103.000.
Hanley, William, to Bendix Corporation, The. Closure member for automotive oil filters and similar filters. 4,314,903, Cl. 210-440.000.
Hansen, Elo H.; and Ruzicka, Jaromir, to Bifok AB. Programmable, continuous flow analyzer. 4,314,824, Cl. 23-230.00R.
Hansen, Robert C., to Caterpillar Tractor Co. Fluidborne noise attenuator. 4,314,621, Cl. 181-233.000.
Hanson, Chris A., to Hanson Industries Incorporated. Removable, adjustable, foot-supporting and foot-positioning, orthopedic inserts for use in athletic footwear. 4,314,411, Cl. 36-81.000.
Hanson, David J. Solar collector. 4,314,548, Cl. 126-429.000.
Hanson Industries Incorporated: *See*—
Hanson, Chris A., 4,314,411, Cl. 36-81.000.
Haque, Yusuf A., to American Microsystems, Inc. CMOS Operational amplifier with improved frequency compensation. 4,315,223, Cl. 330-253.000.
Harada, Hiroshi: *See*—
Abe, Haruhiko; Mashiko, Yoji; Harada, Hiroshi; Asai, Sotoju; Mizuguchi, Kazuo; and Nomoto, Sumio, 4,314,874, Cl. 156-628.000.
Harada, Tsuyoshi; and Oritake, Yoshie. Video signal defect compensation system. 4,315,276, Cl. 358-8.000.
Haraguchi, Keisuke; and Aoki, Harumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Light shielding device for automatic focus detecting. 4,314,747, Cl. 354-25.000.
Harman International Industries, Inc.: *See*—
Fisher, Robert J.; and Lefever, Lawrence R., 4,315,113, Cl. 200-5.00R.
Harmer, Alan L., to Battelle Memorial Institute. Photoelectric switch with visible signal. 4,315,147, Cl. 250-227.000.
Harnish, James R., to Borg-Warner Corporation. Refrigerant condensing system. 4,314,456, Cl. 62-181.000.
Harre, Kurt J. S., to Aktiebolaget Electrolux. Detachable connection assembly for a printing element in an electric office machine. 4,314,770, Cl. 400-175.000.
Harris, Jack W.; and Eskew, Walter H., to Harris, Jack W. Storage and display elevator. 4,314,647, Cl. 211-121.000.
Harris, James E., to United States of America, Commerce. Handcuff improvements. 4,314,466, Cl. 70-16.000.
Harris, Richard E.; and Hamilton, Clark A., to United States of America, Navy. Multiple-quantum interference superconducting analog-to-digital converter. 4,315,255, Cl. 340-347.0AD.
Harrison, Edward S.: *See*—
Nunlist, Erwin J.; Coleman, Howard G.; and Harrison, Edward S., 4,314,396, Cl. 29-156.80R.
Hartman, Charles W.; and Shearer, James W., to United States of America, Energy. Production of field-reversed mirror plasma with a coaxial plasma gun. 4,314,879, Cl. 376-128.000.
Hartmann, Heinrich: *See*—
Lehner, August; Kud, Alexander; and Hartmann, Heinrich, 4,314,922, Cl. 260-29.2TN.
Hartmann, Willi; and Huth, Klaus, to Veb Gaskombinat Schwarze Pumpe. Portable special lathe for flanges of large dimensions. 4,314,491, Cl. 82-4.00R.
Hartmannsgruber, Max; and Wolf, Horst, to Zinser Textilmaschinen GmbH. Roller drive for draw frame. 4,314,388, Cl. 19-293.000.
Harvey, Anthony K.: *See*—
Scott, John G. V.; and Harvey, Anthony K., 4,315,069, Cl. 430-365.000.
Harvey, Donald M., to Eastman Kodak Company. Take-up spool advancing mechanism for a photographic camera. 4,314,751, Cl. 354-212.000.
Harvey, William J.: *See*—
Armstrong, Donald E.; Sindlinger, Ronald E.; and Harvey, William J., 4,314,394, Cl. 29-25.160.
Harwood, Clifford: *See*—
Parks, William L., III; and Harwood, Clifford, 4,315,321, Cl. 364-900.000.
Hasegawa, Akira: *See*—
Yamamura, Yuichi; Hasegawa, Akira; Azuma, Ichiro; and Kobayashi, Shigeru, 4,314,998, Cl. 424-177.000.
Hasegawa, Koichi: *See*—
Tokunaga, Michio; Okada, Ryoichi; Mizutani, Hideo; Hasegawa, Koichi; and Osaki, Takaaki, 4,315,206, Cl. 323-265.000.
Hasegawa, Morihiro: *See*—
Maruhashi, Shigeaki; Hasegawa, Morihiro; and Yamauchi, Takashi, 4,314,847, Cl. 75-51.000.
Haslbeck, Joseph; and Liggins, Allan, to Highland Manufacturing Company, Ltd. Electrical box. 4,315,100, Cl. 174-51.000.
Hass, Alan R., to Lyall Electric, Inc. Molding resin around electrical connector having leads extending therefrom. 4,314,960, Cl. 264-276.000.
Hass, Robert H.; and Ward, John W., to Union Oil Company of California. Catalyst and process for oxidizing hydrogen sulfide. 4,314,983, Cl. 423-542.000.
Hata, Kosei; Hata, Tadayo; and Maruoka, Toshiyuki, to Seikenkai. Pharmaceutical lactobacillus preparations. 4,314,995, Cl. 424-93.000.
Hata, Tadayo: *See*—
Hata, Kosei; Hata, Tadayo; and Maruoka, Toshiyuki, 4,314,995, Cl. 424-93.000.
Hatabe, Etsuo: *See*—
Tokugawa, Fumitake; and Hatabe, Etsuo, 4,315,135, Cl. 219-216.000.
Haubennestel, Karlheinz; and Mehren, Rainer, to Byk-Mallinckrodt Chemische Produkte GmbH. Thixotropic agent for use in coating compositions. 4,314,924, Cl. 260-30.60R.
Hawkins, Donald. Sliding panel latching mechanism. 4,314,719, Cl. 292-252.000.
Hawley, George T.: *See*—
Ciesielka, Albert J.; and Hawley, George T., 4,315,107, Cl. 179-16.00F.
Hayashi, Saburo: *See*—
Okabe, Tohru; Mizutani, Shigeaki; and Hayashi, Saburo, 4,314,803, Cl. 8-94.260.
Hazel, Victor E.: *See*—
Fanning, Alan W.; Jameson, William G., Jr.; and Hazel, Victor E., 4,314,884, Cl. 376-441.000.
Heine, Christian; Ploog, Uwe; and Wust, Reinhold, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Parting oil component for baked goods and parting oils. 4,315,040, Cl. 426-609.000.
Heinen, Peter; and Gossens, Peter, to Akzona Incorporated. Yarn bulking jet. 4,314,391, Cl. 28-273.000.
Heitmann, Heinrich: *See*—
Schmelzer, Christoph; Spohr, Reimar; Krumme, Jens-Peter; Witter, Klaus; and Heitmann, Heinrich, 4,314,894, Cl. 204-192.00M.
Helfgott, Gerald N.: *See*—
Helfgott, Maxwell A.; and Helfgott, Gerald N., 4,314,560, Cl. 128-305.000.
Helfgott, Maxwell A.; and Helfgott, Gerald N. Powered handpiece for endophthalmic surgery. 4,314,560, Cl. 128-305.000.
Hellwig, Lowell L. Vibration dampening ring. 4,314,486, Cl. 74-574.000.
Helwig, William F., Jr., to Avtec Industries, Inc. Energy saving dishwasher. 4,315,140, Cl. 219-486.000.
Henault, Jean-Paul, to Airelec Industries. Temperature regulating device for electric heating apparatus. 4,315,142, Cl. 219-511.000.
Henderson, Don S. Tension pile splice. 4,314,777, Cl. 405-251.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Rose, David; Busch, Peter; Lieske, Edgar; and Konrad, Gunther, 4,314,809, Cl. 8-406.000.
Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See*—
Heine, Christian; Ploog, Uwe; and Wust, Reinhold, 4,315,040, Cl. 426-609.000.
Henry, Michael P.: *See*—
Fedde, Paul A.; Ghosh, Sambhunath; Henry, Michael P.; and Klass, Donald L., 4,314,904, Cl. 210-611.000.
Hermanns, Winfried: *See*—
Lueg, Heinz; Blackert, Hanno; Wimmenauer, Dirk; and Hermanns, Winfried, 4,315,242, Cl. 340-38.00L.
Hermier, Jean: *See*—
Cerf, Olivier; Grenier, Georges; Hermier, Jean; and Rancurel, Alain, 4,314,965, Cl. 422-28.000.
Hernandez, Charles, to Telediffusion de France & Compagnie Continentale de Signalisation. Method and device for addressing a page memory in a videotex system. 4,315,257, Cl. 340-723.000.
Heussy, William C., deceased: *See*—
Orchard, Richard D.; Barbee, Kurt L.; Whiting, Bradford S.; Heussy, William C., deceased; and Pavenstedt, Loyal L., executrix, 4,315,317, Cl. 364-510.000.
Hidalgo, Jean L.: *See*—
Reymond, Jean C.; Hidalgo, Jean L.; and Skenderoff, Claude, 4,314,761, Cl. 356-141.000.
Higashi, Masanori: *See*—
Sudo, Masatoshi; Higashi, Masanori; Ohki, Tsuguaki; and Kanbe, Shoji, 4,314,862, Cl. 148-12.00F.
Highland Manufacturing Company, Ltd.: *See*—
Haslbeck, Joseph; and Liggins, Allan, 4,315,100, Cl. 174-51.000.
Hill-Rom Company, Inc.: *See*—
Fullenkamp, Eugene; and Foster, Dale, 4,314,735, Cl. 339-45.00R.

Hilti Aktiengesellschaft: *See*—
Leibhard, Erich; Schiefer, Erwin; and Stirnweiss, Peter, 4,314,655, Cl. 222-146.0HE.
Hipp, Paul: *See*—
Muller, Gottfried; and Hipp, Paul, 4,314,544, Cl. 126-417.000.
Hiraga, Ryozo: *See*—
Suzuki, Akiyoshi; Hiraga, Ryozo; Kano, Ichiro; Yoshinari, Hideki; Totsuka, Masao; Kato, Yuzo; and Ogino, Yasuo, 4,315,201, Cl. 318-640.000.
Hirakawa, Tadeshi; Kusubayashi, Tochiaki; and Oku, Yukio, to Mitsubishi Jukogyo Kabushiki Kaisha. Method and apparatus for preventing warp in corrugated cardboard. 4,314,868, Cl. 156-207.000.
Hirano, Tomiyoshi; Shinada, Hidehiro; and Sawada, Michiyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Reflective lamp. 4,315,186, Cl. 313-111.000.
Hirayama, Kazuhiro: *See*—
Amitani, Joji; Ito, Takashi; and Hirayama, Kazuhiro, 4,314,756, Cl. 355-15.000.
Hirayama, Yoshihiko: *See*—
Sakami, Ryoichiro; and Hirayama, Yoshihiko, 4,315,332, Cl. 455-181.000.
Hirohata, Hyogo: *See*—
Todoroki, Tsunehiko; and Hirohata, Hyogo, 4,314,848, Cl. 75-173.00C.
Hisaka Works Ltd.: *See*—
Sumitomo, Hiroyuki; Doi, Masafumi; Kobayashi, Kazuyuki; Fukami, Katsutoshi; and Kawanishi, Kenzo, 4,314,605, Cl. 165-110.000.
Hitachi, Ltd.: *See*—
Chinone, Naoki; Saito, Kazutoshi; Shige, Noriyuki; and Ito, Ryoichi, 4,315,226, Cl. 372-45.000.
Fukui, Hiroshi; and Kimura, Shin, 4,315,274, Cl. 357-38.000.
Ibamoto, Masahiko; Narita, Hiroshi; Oouchi, Noboru; and Okamatsu, Shigetoshi, 4,315,203, Cl. 318-807.000.
Inagaki, Masahisa; Jinbou, Ryutarou; Unino, Tomio; and Shida, Tomohiko, 4,315,130, Cl. 219-121.00L.
Kamejima, Kohji; Kano, Minoru; Tanaka, Hideki; and Fukushima, Toshihiko, 4,314,454, Cl. 62-98.000.
Kishi, Tuneo; Sasaki, Koji; and Moriya, Michio, 4,315,119, Cl. 200-145.000.
Kondo, Hisashi; Yamazaki, Shozo; and Yamada, Yukio, 4,315,231, Cl. 335-61.000.
Kyomasu, Ryuichi; Hanashima, Shuichi; and Suzumura, Yoshikazu, 4,315,199, Cl. 318-601.000.
Nishimiya, Torazo; Okumura, Masamitsu; and Numakura, Seisaku, 4,314,585, Cl. 137-625.340.
Ohhinata, Ichiro, 4,315,168, Cl. 307-252.00G.
Saito, Toru; and Takeshima, Masaki, 4,314,828, Cl. 55-26.000.
Tokunaga, Michio; Okada, Ryoichi; Mizutani, Hideo; Hasegawa, Koichi; and Osaki, Takaaki, 4,315,206, Cl. 323-265.000.
Hobbs, Edwin L. Device for arborist contractors. 4,314,693, Cl. 254-376.000.
Hochtemperatur-Reaktorbau GmbH.: *See*—
Fritz, Rolf; Schoening, Josef; Elter, Claus; and Theymann, Walter, 4,314,883, Cl. 376-381.000.
Hodder, James J.: *See*—
Beier, William C.; and Hodder, James J., 4,314,802, Cl. 8-94.260.
Hodge, Malcolm H.; and Tabb, Leroy, Jr., to TRW Inc. Optical sensing device. 4,314,760, Cl. 356-4.000.
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Feess, Erich; and Reinhardt, Friedrich, 4,314,811, Cl. 8-457.000.
Feess, Erich, 4,314,812, Cl. 8-457.000.
Muller, Walter; Gauer, Richard; Walkenhorst, Wilfried; and Wild, Gerhard, 4,314,606, Cl. 165-163.000.
Hofer, Alan. Speaker. 4,315,112, Cl. 179-115.50R.
Hoffend, Thomas R.; and Levy, Moshe, to Xerox Corporation. Toner pigment treatment process for reducing the residual styrene monomer concentration to .ess than 0.5 percent by weight. 4,314,931, Cl. 260-42.530.
Hoffman, Gordon B.; and Callahan, Michael J., Jr., to Mostek Corporation. Integrated circuit chip telephone communication system. 4,315,108, Cl. 179-84.0VF.
Hoffmann, Otto L.; and Patel, Natu R., to Gulf Oil Corporation. 1-Benzoyl-3-hydroxy-6(1H)-pyridazinones employed as plant growth regulators. 4,314,843, Cl. 71-92.000.
Hofstad, David P. Drum having internal double acting control to provide variable pitch. 4,314,498, Cl. 84-411.00A.
Hogle, Richard A.: *See*—
Hsu, George C.; Levin, Harry; Hogle, Richard A.; Praturi, Ananda; and Lutwack, Ralph, 4,314,525, Cl. 118-716.000.
Hohenschutz, Heinz; Gnad, Josef; Dinkhauser, Guenter; and Schaefer, Eberhard, to BASF Aktiengesellschaft. Process for completing the esterification of carboxylic acids with alcohols. 4,314,947, Cl. 260-410.000.
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Fox, Sidney W.; and Holden, Arthur I., 4,315,072, Cl. 430-628.000.
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Loffler, Walter, 4,314,387, Cl. 19-98.000.
Holzbaur, Siegfried; and Eckert, Konrad, to Robert Bosch GmbH. Mixture preparation apparatus. 4,314,951, Cl. 261-44.00D.
Holze, Ernest P., Jr., to Branson Ultrasonics Corporation. Ultrasonic resonator (horn) with skewed slots. 4,315,181, Cl. 310-323.000.
Homeyer, Bernhard: *See*—
Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, 4,315,008, Cl. 424-200.000.
Honda, Makoto: *See*—
Nishikawa, Seiichi; and Honda, Makoto, 4,315,145, Cl. 235-493.000.
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Ueda, Yuziro; Yoshida, Toru; and Honda, Michiyasu, 4,314,694, Cl. 266-44.000.
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Clauss, Richard J., 4,314,893, Cl. 204-40.000.
Hoppe, James C., to United States of America, Air Force. Instantaneous opening positive lock mechanism. 4,314,500, Cl. 89-1.00B.
Horigome, Eiji; Azegami, Hitoshi; and Ohta, Hiroshi, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,315,057, Cl. 428-694.000.
Horrocks, Donald L., to Beckman Instruments, Inc. Detecting phase separation in liquid scintillation samples. 4,315,151, Cl. 250-362.000.
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Ishizaka, Sunao; and Hozumi, Toshiaki, 4,314,752, Cl. 354-286.000.
Hsu, George C.; Levin, Harry; Hogle, Richard A.; Praturi, Ananda; and Lutwack, Ralph, to California Institute of Technology. Fluidized bed silicon deposition from silane. 4,314,525, Cl. 118-716.000.
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Partyka, Richard A.; and Hudyma, Thomas W., 4,315,023, Cl. 424-273.00R.
Huffman, William F.; and Wilson, James W., to SmithKline Corporation. 4-Aminoalkyl-7-hydroxy-2(3H)-indolones. 4,314,944, Cl. 260-326.150.
Huggins, Robert A.: *See*—
Raistrick, Ian D.; Poris, Jaime; and Huggins, Robert A., 4,315,059, Cl. 429-112.000.
Hughes Aircraft Company: *See*—
Vahrenkamp, Richard P., 4,315,153, Cl. 250-396.00R.
Hughes, John B., to U.S. Philips Corporation. Frequency divider arrangement. 4,315,166, Cl. 307-225.00R.
Hulcombe, Barry J., to Monier Colourtile Pty. Ltd. Roof tile fixing clip. 4,314,433, Cl. 52-521.000.
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Bricker, Robert E.; and Humpleby, Paul J., 4,314,425, Cl. 51-267.000.
Husaini, Saeed A.; and Liu, Richard T., to Societe d'Assistance Technique pour Produits Nestle S.A. Process for decaffeinating tea. 4,315,036, Cl. 426-387.000.
Hutchinson, Richard T. Insert for tills. 4,314,632, Cl. 206-0.810.
Huth, Klaus: *See*—
Hartmann, Willi; and Huth, Klaus, 4,314,491, Cl. 82-4.00R.
Hybrid Technology Corporation: *See*—
Spigarelli, Donald J., 4,315,042, Cl. 427-96.000.
Hyosu, Yoshihiko: *See*—
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Ibamoto, Masahiko; Narita, Hiroshi; Oouchi, Noboru; and Okamatsu, Shigetoshi, to Hitachi, Ltd. Control system for induction motor-driven car. 4,315,203, Cl. 318-807.000.
Ibrahim, Fayez F., to Tyler Refrigeration Corporation. Island refrigerated display case with air defrost. 4,314,457, Cl. 62-256.000.
ICI Australia Limited: *See*—
Love, Thomas L., 4,314,508, Cl. 102-275.700.
IHC Holland N.V.: *See*—
Visser, Teunis, 4,314,660, Cl. 228-140.000.
Ihrman, Kryn G.: *See*—
Wollensak, John C.; and Ihrman, Kryn G., 4,314,962, Cl. 264-328.600.
Ikawa, Kenji: *See*—
Ito, Kanji; Ikawa, Kenji; Yukinaga, Hisajiro; and Sugita, Jitsuo, 4,314,845, Cl. 71-103.000.
Ikeda, Hironosuke; Narukawa, Satoshi; and Nakaido, Shigehiro, to Sanyo Electric Co., Ltd. Battery with internal electrical connectors. 4,315,061, Cl. 429-161.000.
Ikeda, Masahiko: *See*—
Ito, Yoshinori; Ikeda, Masahiko; and Furuichi, Junji, 4,315,127, Cl. 219-73.100.
Ikeda, Tamaki: *See*—
Tsuji, Yoshiomi; Matsuda, Akio; Ikeda, Tamaki; and Mori, Kenji, 4,314,774, Cl. 405-115.000.

Ikeura, Kenji, to Nissan Motor Co., Ltd. Method and apparatus for ignition system spark timing control where exhaust gas recirculation is used. 4,314,540, Cl. 123-571.000.

Ikushima, Takeshi: *See*—
Takahashi, Noboru; Ozaki, Sadao; Isono, Hiromasa; Nishihara, Toshikazu; Ikushima, Takeshi; and Naruse, Tunehide, 4,315,052, Cl. 428-328.000.

IMED Corporation: *See*—
Cannon, Raymond E., 4,314,567, Cl. 128-214.00F.

Imperial Chemical Industries Limited: *See*—
Balassubramanyan, Sugavanam; and Shephard, Margaret C., 4,315,016, Cl. 424-269.000.
Jones, Derrick F.; and Oldham, Keith, 4,315,009, Cl. 424-248.400.

Inagaki, Masahisa; Jinbou, Ryutarou; Unino, Tomio; and Shida, Tomohiko, to Hitachi, Ltd. Method of treating object by laser beam and apparatus therefor. 4,315,130, Cl. 219-121.00L.

Inerte, Maria. Tooth-pick having one folded end and associated pocket container box. 4,314,574, Cl. 132-89.000.

Ingersoll-Rand Co.: *See*—
Cantrel, James F., 4,314,778, Cl. 405-259.000.

Inomata, Shigeo: *See*—
Watanabe, Takashi; Yamano, Katsushi; Yamamoto, Kunio; and Inomata, Shigeo, 4,314,850, Cl. 106-15.050.

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Ducol, Jean-Paul; Mesny, Jacques; and Warret, Julien, 4,314,462, Cl. 66-152.000.

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Stein, Bernard; and Granoff, Richard A., 4,314,970, Cl. 422-72.000.

Intel Corporation: *See*—
Bayliss, John A.; Cox, George W.; Forbes, Bert E.; and Kahn, Kevin C., 4,315,310, Cl. 364-200.000.
Jackson, Daniel K., 4,315,308, Cl. 364-200.000.

International Business Machines Corporation: *See*—
Brickman, Norman F.; and Graziano, Bruno R., 4,315,330, Cl. 370-104.000.
Holecek, Joseph J.; and Zell, Michael N., 4,315,289, Cl. 360-99.000.
Jacquart, Christian, 4,315,307, Cl. 363-134.000.
James, Edmund H., III, 4,314,769, Cl. 400-144.200.
Pelc, Rafael, 4,315,167, Cl. 307-241.000.

International Flavors & Fragrances Inc.: *See*—
Wiegers, Wilhelmus J.; Sprecker, Mark A.; Watkins, Hugh; Vock, Manfred H.; and Schmitt, Frederick L., 4,314,915, Cl. 252-522.00R.

International Harvester Company: *See*—
Gagliani, John; and Lee, Raymond, 4,315,076, Cl. 521-77.000.
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International Minerals & Chemical Corporation: *See*—
Madsen, James B.; and Brown, Daniel R., 4,314,829, Cl. 55-98.000.

International Paper Company: *See*—
Gordon, Robert L.; and Wolak, Paul Z., 4,314,638, Cl. 206-427.000.

International Telephone and Telegraph Corporation: *See*—
Bickel, Gary W., 4,314,740, Cl. 350-96.150.
Chea, Ramon C. W., Jr., 4,315,106, Cl. 179-16.00F.
Davis, James M., 4,315,110, Cl. 179-99.00M.
Monti, James H., Jr., 4,315,114, Cl. 200-5.00A.

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Ioannou, Tom K.: *See*—
Downing, James H.; Wells, James E., III; and Ioannou, Tom K., 4,314,908, Cl. 252-182.000.

Iowa Mold Tooling Co., Inc.: *See*—
Zrostlik, Francis L.; and Collins, John J., 4,314,597, Cl. 157-1.110.

Ishida, Kohji: *See*—
Numata, Tatsuo; and Ishida, Kohji, 4,315,221, Cl. 330-51.000.

Ishida, Masamitsu: *See*—
Kato, Hisatoyo; Ishida, Masamitsu; and Matsumoto, Seiji, 4,315,318, Cl. 364-515.000.

Ishida, Toshimichi; Takayanagi, Takeo; and Taki, Yasuo, to Matsushita Electric Industrial Co., Ltd. Method of mounting electronic components. 4,314,870, Cl. 156-272.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Shimizu, Masami, 4,314,705, Cl. 277-67.000.
Tagami, Ichizo, 4,315,252, Cl. 340-347.00P.

Ishizaka, Sunao; and Hozumi, Toshiaki, to Nippon Kogaku K.K. Mount device of a focal length changing auxiliary lens. 4,314,752, Cl. 354-286.000.

ISI Fluid Power, Inc.: *See*—
Brinkel, Edwin P.; and Dellach, Philip J., 4,314,502, Cl. 91-438.000.

Isliker, Gaston R.: *See*—
Mulkins, George F.; Dombrowski, Jerome P.; and Isliker, Gaston R., 4,315,298, Cl. 361-253.000.

Isomura, Shohei: *See*—
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Isono, Hiromasa: *See*—
Takahashi, Noboru; Ozaki, Sadao; Isono, Hiromasa; Nishihara, Toshikazu; Ikushima, Takeshi; and Naruse, Tunehide, 4,315,052, Cl. 428-328.000.

Isshiki, Isao: *See*—
Nakahara, Tsuneo; Yoshida, Kenichi; Tsuno, Koichi; and Isshiki, Isao, 4,315,245, Cl. 340-146.3AG.

Itakura, Tsuyoshi: *See*—
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Ito, Kanji; Ikawa, Kenji; Yukinaga, Hisajiro; and Sugita, Jitsuo, to Shionogi & Co., Ltd. $N^4$-Phenoxyalkanoylsulfanilamides and herbicidal composition containing the same. 4,314,845, Cl. 71-103.000.

Ito, Ryoichi: *See*—
Chinone, Naoki; Saito, Kazutoshi; Shige, Noriyuki; and Ito, Ryoichi, 4,315,226, Cl. 372-45.000.

Ito, Takashi: *See*—
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Ito, Yoshinori; Ikeda, Masahiko; and Furuichi, Junji, to Sumitomo Metal Industries Limited. Electro-slag welding method. 4,315,127, Cl. 219-73.100.

Itoh, Katsumi: *See*—
Mori, Kazumasa; Asahi, Taro; Banzai, Keiichiro; Iwaki, Katsutaro; Muto, Katsuya; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,315,205, Cl. 322-99.000.

Itoi, Kazuo: *See*—
Mori, Fumio; Omura, Yoshiaki; Fujita, Yoshiji; Nishida, Takashi; Hosogai, Takeo; Wada, Fumio; Aihara, Sukeji; Tamai, Yoshin; and Itoi, Kazuo, 4,315,029, Cl. 424-304.000.

Iwaki, Katsutaro: *See*—
Mori, Kazumasa; Asahi, Taro; Banzai, Keiichiro; Iwaki, Katsutaro; Muto, Katsuya; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,315,205, Cl. 322-99.000.

Iwano, Yoshimi: *See*—
Suzuki, Hajime; Umemura, Yoshifumi; Kimbara, Masahiko; and Iwano, Yoshimi, 4,314,590, Cl. 139-435.000.

Izumi Denki Corporation: *See*—
Fujita, Teizo; and Kimura, Haruo, 4,315,123, Cl. 200-307.000.

Jackson, Daniel K., to Intel Corporation. Interface between a microprocessor chip and peripheral subsystems. 4,315,308, Cl. 364-200.000.

Jacob, Keith D.: *See*—
Apple, William C.; and Jacob, Keith D., 4,315,249, Cl. 340-825.520.

Jacobs, Philip C., Jr. Composite fusible element for electric current-limiting fuses. 4,315,235, Cl. 337-296.000.

Jacobson, Sava. Automatically reset control mechanism for remote playout telephone answering device. 4,315,104, Cl. 179-6.070.

Jacobson, Sava. Electronic ring sounder for a speaker telephone. 4,315,109, Cl. 179-84.00T.

Jacoby, Richard: *See*—
Anderson, Blair V.; Feldman, Morris; and Jacoby, Richard, 4,314,412, Cl. 36-100.000.

Jacquart, Christian, to International Business Machines Corp. Switching device and switched-type power supply using the same. 4,315,307, Cl. 363-134.000.

Jacquet, Bernard; Lang, Gerard; and Forestier, Serge, to L'Oreal. Dye polymers, their preparation and their use in dye compositions. 4,314,808, Cl. 8-405.000.

James Brown & Sons: *See*—
Widmer, Colin F., 4,314,695, Cl. 266-194.000.

James, Edmund H., III, to International Business Machines Corporation. Acoustical tone generator. 4,314,769, Cl. 400-144.200.

Jameson, William G., Jr.: *See*—
Fanning, Alan W.; Jameson, William G., Jr.; and Hazel, Victor E., 4,314,884, Cl. 376-441.000.

Jansen, Harald; Oelert, Gerhard; and Kohnke, Hans-Jurgen, to Stiebel Eltron GmbH & Co., KG. Method of heating with an absorption heat pump. 4,314,668, Cl. 237-2.00B.

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Sack, Werner; and Lindig, Otto, 4,315,054, Cl. 428-433.000.

Jeter, Thomas R.; and Donovan, William F., to United States of America, Army. Kinetic sabot system. 4,314,510, Cl. 102-523.000.

Jezek, Ben F., Jr.: *See*—
Madewell, Tommy J.; and Jezek, Ben F., Jr., 4,314,672, Cl. 239-424.000.

Jimena, Carlos L. Generator flashlight. 4,315,301, Cl. 362-193.000.

Jimenez, Miguel A.; and Saucedo, Manuel M., to Griffin, Patrick O., by said Manuel M. Saucedo. Seed singulator. 4,314,515, Cl. 111-77.000.

Jinbou, Ryutarou: *See*—
Inagaki, Masahisa; Jinbou, Ryutarou; Unino, Tomio; and Shida, Tomohiko, 4,315,130, Cl. 219-121.00L.

JNPC Investments (Proprietary) Limited: *See*—
Cain, James T., 4,314,417, Cl. 40-209.000.

Johns Hopkins University, The: *See*—
Kossiakoff, Alexander, 4,315,315, Cl. 364-300.000.

Johnson Controls, Inc.: *See*—
Lederman, Warren A., 4,314,578, Cl. 137-84.000.

Johnson, Delp W. Method of site casting tunnels, culverts, pressure pipes with minimum forming. 4,314,775, Cl. 405-155.000.

Johnson, Irvin D., to Marathon Oil Company. Well fluid velocity measurement method and system. 4,314,476, Cl. 73-155.000.

Johnson & Johnson: *See*—
Krainski, Theodore J., Jr., 4,314,482, Cl. 73-805.000.

Johnson & Johnson Products Inc.: *See*—
Sipos, Tibor, 4,314,991, Cl. 424-56.000.

Johnson, Marvin M.: *See*—
Nowack, Gerhard P.; and Johnson, Marvin M., 4,314,901, Cl. 208-216.00R.

Johnson, Wayne S.: *See*—
Monte, Charles S.; and Johnson, Wayne S., 4,314,897, Cl. 204-299.00R.

Jojima, Teruomi: *See*—
Fahmy, Mohamed A. H.; Fukuto, Tetsuo R.; and Jojima, Teruomi, 4,315,026, Cl. 424-282.000.
Jones, Derrick F.; and Oldham, Keith, to Imperial Chemical Industries Limited. Antisecretory guanidine derivatives and pharmaceutical compositions containing them. 4,315,009, Cl. 424-248.400.
Josef Martin Feuerungsbau GmbH, Firma: *See*—
Martin, Johannes J.; and Martin, Walter J., 4,314,541, Cl. 126-163.00R.
Jukkola, Walfred W.: *See*—
Kwon, Henry S. C.; and Jukkola, Walfred W., 4,314,967, Cl. 422-49.000.
Jung, Michel: *See*—
Bey, Philippe; and Jung, Michel, 4,315,095, Cl. 548-344.000.
Junod, Michael T.; and Bates, Albert M., to United States of America, Navy. Directly modulated sonobuoy transmitter using surface acoustic wave sensor. 4,315,324, Cl. 367-3.000.
Jureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Miyamori, Tamotsu; Kaji, Hisatsugu; Kameyama, Iwao; and Takahashi, Michio, 4,314,981, Cl. 423-447.700.
Just, Gerhard: *See*—
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JWI Ltd.: *See*—
Buchanan, John G.; and MacBean, Donald G., 4,314,589, Cl. 139-383.00A.
Kabushiki Kaisha Daini Seikosha: *See*—
Sakami, Ryoichiro; and Hirayama, Yoshihiko, 4,315,332, Cl. 455-181.000.
Torisawa, Akira; Ueda, Makoto; and Shida, Masaharu, 4,315,329, Cl. 368-76.000.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Kondo, Yoh-Ichi, 4,314,493, Cl. 84-1.030.
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Sakamoto, Masaaki, 4,314,617, Cl. 180-6.480.
Kabushiki Kaisha Kubota Seisakusho: *See*—
Ouchi, Yoshiichi, 4,314,663, Cl. 233-26.000.
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Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Kokubu, Sadao; and Endou, Nobuhiro, 4,315,117, Cl. 200-61.270.
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Miyamoto, Noriaki; Shiraki, Masao; and Mitsuya, Kinpei, 4,314,438, Cl. 57-58.890.
Onoue, Keiji; Katoh, Takashi; Yoshida, Yoshiaki; and Seiki, Kazuo, 4,314,440, Cl. 57-301.000.
Suzuki, Hajime; Umemura, Yoshifumi; Kimbara, Masahiko; and Iwano, Yoshimi, 4,314,590, Cl. 139-435.000.
Kadell, Roger J. Laryngoscope. 4,314,551, Cl. 128-11.000.
Kahn, Kevin C.: *See*—
Bayliss, John A.; Cox, George W.; Forbes, Bert E.; and Kahn, Kevin C., 4,315,310, Cl. 364-200.000.
Kaji, Hisatsugu: *See*—
Miyamori, Tamotsu; Kaji, Hisatsugu; Kameyama, Iwao; and Takahashi, Michio, 4,314,981, Cl. 423-447.700.
Kakigi, Takao: *See*—
Kakigi, Yasugi; and Kakigi, Takao, 4,315,158, Cl. 250-574.000.
Kakigi, Yasugi; and Kakigi, Takao, to Cybernet Electronics Corporation. Photoelectric smoke sensing chamber and smoke sensor box. 4,315,158, Cl. 250-574.000.
Kakimoto, Kohichi: *See*—
Osaki, Mikio; Kamada, Hiroshi; Kakimoto, Kohichi; and Tabuchi, Toshiaki, 4,315,322, Cl. 364-900.000.
Kalaus, Gyoorgy: *See*—
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Kalaus, Gyorgy: *See*—
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Kamada, Hiroshi: *See*—
Osaki, Mikio; Kamada, Hiroshi; Kakimoto, Kohichi; and Tabuchi, Toshiaki, 4,315,322, Cl. 364-900.000.
Kamejima, Kohji; Kano, Minoru; Tanaka, Hideki; and Fukushima, Toshihiko, to Hitachi, Ltd. Method of operating refrigerating machine. 4,314,454, Cl. 62-98.000.
Kameyama, Iwao: *See*—
Miyamori, Tamotsu; Kaji, Hisatsugu; Kameyama, Iwao; and Takahashi, Michio, 4,314,981, Cl. 423-447.700.
Kamoshita, Akio; Matsumoto, Akihiko; and Kurihara, Takashi, to Nissan Motor Co., Ltd. Rack and pinion steering gear housing mounting structure. 4,314,710, Cl. 280-96.000.
Kamp, Heinz; Becker, Rolf; and Stops, Manfred, to W. Schlafhorst & Co. Device for charging a textile machine with coil tubes. 4,314,439, Cl. 57-270.000.
Kanamaru, Koichi; and Takeuchi, Misao, to Nissan Motor Company, Limited. Switch assembly with leakage current detecting means. 4,315,116, Cl. 200-61.090.
Kanamori, Masaru: *See*—
Yamamoto, Kazuhiko; Matsushita, Yoshiaki; Kanamori, Masaru; Nagasawa, Kazutoshi; Yoshihiro, Naotsugu; and Kishino, Seigo, 4,314,595, Cl. 148-1.500.
Kanbe, Shoji: *See*—
Sudo, Masatoshi; Higashi, Masanori; Ohki, Tsuguaki; and Kanbe, Shoji, 4,314,862, Cl. 148-12.00F.
Kano, Ichiro: *See*—
Suzuki, Akiyoshi; Hiraga, Ryozo; Kano, Ichiro; Yoshinari, Hideki; Totsuka, Masao; Kato, Yuzo; and Ogino, Yasuo, 4,315,201, Cl. 318-640.000.
Kano, Minoru: *See*—
Kamejima, Kohji; Kano, Minoru; Tanaka, Hideki; and Fukushima, Toshihiko, 4,314,454, Cl. 62-98.000.
Kansai Paint Co., Ltd.: *See*—
Watanabe, Takashi; Yamano, Katsushi; Yamamoto, Kunio; and Inomata, Shigeo, 4,314,850, Cl. 106-15.050.
Kaplan, Donald S., to American Cyanamid Company. Surgical suture derived from segmented polyether-ester block copolymers. 4,314,561, Cl. 128-335.500.
Kardios Systems Corporation, The: *See*—
Parks, William L., III; and Harwood, Clifford, 4,315,321, Cl. 364-900.000.
Karlsson, Gosta: *See*—
Granstrom, Staffan; and Karlsson, Gosta, 4,315,124, Cl. 219-10.710.
Karpati, Egon: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyoorgy; Dancsi, Lajos; Keve, Tibor; Karpati, Egon; and Szporny, Laszlo, 4,315,011, Cl. 424-262.000.
Karpov, Evgeny F.; Birenberg, Isaak E.; Basovsky, Boris I.; and Popov, Vladimir V. Method for checking thermocatalytic sensors of mine safety systems. 4,314,475, Cl. 73-27.00R.
Kasahara, Nobuyoshi; and Nonomura, Koutarou, to Mitsui Mining & Smelting Co., Ltd. Process for dyeing zinc and zinc alloys. 4,314,859, Cl. 148-6.100.
Kasahara, Takahiko; Yamaguchi, Tukasa; Shichi, Shigeharu; Kato, Masayuki; and Suito, Senji, to Aisin Seiki Kabushiki Kaisha. Sewing machine with supplemental work supporting surface. 4,314,517, Cl. 112-260.000.
Kastar, Inc.: *See*—
Epstein, Harry, 4,314,383, Cl. 7-170.000.
Kataoka, Shoei, to Agency of Industrial Science & Technology Ministry of International Trade & Industry. Displacement sensor using a galvanomagnetic element positioned in a periodically inverted magnetic field. 4,315,214, Cl. 324-208.000.
Kato, Hisatoyo; Ishida, Masamitsu; and Matsumoto, Seiji, to Fuji Photo Film Co., Ltd. Method and apparatus for processing a radiation image. 4,315,318, Cl. 364-515.000.
Kato, Masayuki: *See*—
Kasahara, Takahiko; Yamaguchi, Tukasa; Shichi, Shigeharu; Kato, Masayuki; and Suito, Senji, 4,314,517, Cl. 112-260.000.
Kato, Yuzo: *See*—
Suzuki, Akiyoshi; Hiraga, Ryozo; Kano, Ichiro; Yoshinari, Hideki; Totsuka, Masao; Kato, Yuzo; and Ogino, Yasuo, 4,315,201, Cl. 318-640.000.
Katoh, Takashi: *See*—
Onoue, Keiji; Katoh, Takashi; Yoshida, Yoshiaki; and Seiki, Kazuo, 4,314,440, Cl. 57-301.000.
Katto, Takayuki: *See*—
Kobayashi, Akio; and Katto, Takayuki, 4,315,081, Cl. 525-2.000.
Kaufmann, Kenneth M., to Pako Corporation. Automatic inverse fix replenisher control. 4,314,753, Cl. 354-321.000.
Kawabata, Takashi; Hosoe, Kazuyas; Shinoda, Nobuhiko; Sakai, Shinji; and Kinoshita, Takao, to Canon Kabushiki Kaisha. Camera having a semi-automatic focus adjusting device. 4,314,748, Cl. 354-25.000.
Kawahara, James B. Drafting board storage tray. 4,314,407, Cl. 33-444.000.
Kawanishi, Kenzo: *See*—
Sumitomo, Hiroyuki; Doi, Masafumi; Kobayashi, Kazuyuki; Fukami, Katsutoshi; and Kawanishi, Kenzo, 4,314,605, Cl. 165-110.000.
Kazierod, William E. Special effects photographic printing easel arrangement. 4,314,758, Cl. 355-40.000.
Keene Corporation: *See*—
Petralia, Salvatore C., 4,315,302, Cl. 362-226.000.
Keiper Automobiltechnik GmbH & Co. KG: *See*—
Klueting, Bernd, 4,314,729, Cl. 297-366.000.
Keller, Teddy M.; and Griffith, James R., to United States of America, Navy. Fluorinated polyphthalocyanines. 4,315,093, Cl. 528-362.000.
Kelly, Thomas R., to Thomas J. Lipton, Inc. Process for forming a molded ice confection. 4,315,037, Cl. 426-421.000.
Kenney, James F.: *See*—
Deminet, Czeslaw; and Kenney, James F., 4,314,741, Cl. 350-96.330.
Keresztes, Robert J., to Bendix Corporation, The. Retention device for capturing a spent thermal fuse. 4,314,596, Cl. 152-330.00R.
Kernforschungsanlage Julich, Gesellschaft mit beschrankter Haftung: *See*—
Luhleich, Hartmut; and Dias, Francisco J., 4,314,599, Cl. 164-16.000.
Kessler, Milton. Childproof push-pull container closure. 4,314,656, Cl. 222-153.000.
Keve, Tibor: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; and Drexler, Ferenc, 4,314,939, Cl. 260-239.30P.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyoorgy; Dancsi, Lajos; Keve, Tibor; Karpati, Egon; and Szporny, Laszlo, 4,315,011, Cl. 424-262.000.
Kimbara, Masahiko: *See*—
Suzuki, Hajime; Umemura, Yoshifumi; Kimbara, Masahiko; and Iwano, Yoshimi, 4,314,590, Cl. 139-435.000.
Kimura, Haruo: *See*—
Fujita, Teizo; and Kimura, Haruo, 4,315,123, Cl. 200-307.000.

Kimura, Shin: *See*—
Fukui, Hiroshi; and Kimura, Shin, 4,315,274, Cl. 357-38.000.
Kinashi, Hiroshi, to Sharp Kabushiki Kaisha. Bias voltage controlled developing system in an electrophotographic copying machine. 4,314,755, Cl. 355-14.00D.
Kinjo, Hisao; and Ozawa, Keiji, to Victor Company of Japan, Ltd. High density recording system using side-by-side information and servo tracks. 4,315,283, Cl. 358-128.600.
Kinoshita, Takao: *See*—
Kawabata, Takashi; Hosoe, Kazuyas; Shinoda, Nobuhiko; Sakai, Shinji; and Kinoshita, Takao, 4,314,748, Cl. 354-25.000.
Kinsler, Martin R.: *See*—
Barnett, Burton; Kinsler, Martin R.; and Nelson, Lyle A., 4,314,682, Cl. 244-158.00R.
Kirkpatrick, Robert G.; and Snyder, Ronald R., to General Electric Company. High rate of fire revolving battery gun. 4,314,501, Cl. 89-12.000.
Kishi, Tuneo; Sasaki, Koji; and Moriya, Michio, to Hitachi, Ltd. Tank type gas circuit breaker. 4,315,119, Cl. 200-145.000.
Kishimoto, Yoshio: *See*—
Sonoda, Nobuo; Shimotsuma, Wataru; Kishimoto, Yoshio; and Sekine, Yoichi, 4,315,267, Cl. 346-1.100.
Kishino, Seigo: *See*—
Yamamoto, Kazuhiko; Matsushita, Yoshiaki; Kanamori, Masaru; Nagasawa, Kazutoshi; Yoshihiro, Naotsugu; and Kishino, Seigo, 4,314,595, Cl. 148-1.500.
Kiss, Gyorgy: *See*—
Shilander, Frank R.; and Kiss, Gyorgy, 4,314,629, Cl. 198-500.000.
Kistler Instruments AG: *See*—
Wolfer, Peter; Derrer, Hans-Rudolf; Vollenweider, Max; and Sonderegger, Hans-Conrad, 4,314,481, Cl. 73-774.000.
Kitagawa, Sadao; Okada, Isao; and Saito, Teruo, to Mitsubishi Petrochemical Co., Ltd. Process for producing α-olefin polymer. 4,315,088, Cl. 526-125.000.
Kitamura, Takashi; Sumi, Yoshiro; and Matsufuji, Akira, to Nippon Steel Corporation. Rolling mill. 4,314,469, Cl. 72-221.000.
Kitayama, Fujio, to Niles Parts Company, Ltd. Disconnection detecting circuit of double-filament spherical lamp. 4,315,196, Cl. 315-132.000.
Kiwak, Robert S., to Bendix Corporation, The. Air cooler for self-contained breathing system. 4,314,566, Cl. 128-204.150.
Klanica, Joseph A.: *See*—
Birkmeyer, William J.; Lewarchik, Ronald J.; Klanica, Joseph A.; and Anderson, Carl C., 4,314,918, Cl. 260-20.000.
Klar, Erhard: *See*—
Ro, David H.; Klar, Erhard; and Whitman, C. I., 4,314,849, Cl. 75-228.000.
Klass, Donald L.: *See*—
Fedde, Paul A.; Ghosh, Sambhunath; Henry, Michael P.; and Klass, Donald L., 4,314,904, Cl. 210-611.000.
Kleinmann, Robert. Method of control of acid drainage from exposed pyritic materials. 4,314,966, Cl. 422-28.000.
Klop, Marius A. F.: *See*—
Feenstra, Johannes; Klop, Marius A. F.; Meerman, Wilhelmus C. P. M.; Peelen, Jan G. J.; and Tuin, Hermanus N., 4,314,834, Cl. 65-11.100.
Klueting, Bernd, to Keiper Automobiltechnik GmbH & Co. KG. Hinge mount for seats having reclineable back rests, particularly for motor vehicle seats. 4,314,729, Cl. 297-366.000.
Kluge, Arthur F.; Strosberg, Arthur M.; Whiting, Roger; and Christie, George A., to Syntex (U.S.A.) Inc. 2-(1,4-Benzodioxan-2-ylalkyl-)imidazoles. 4,315,021, Cl. 424-273.00R.
Knight, George W.: *See*—
Lowery, Kirby, Jr.; Knight, George W.; and May, James A., Jr., 4,314,912, Cl. 252-429.00B.
Knight, Peter C., to Lever Brothers Company. Process for reducing friability of detergent powders. 4,314,953, Cl. 264-13.000.
Knobel, Walter, to Davy International AG. Process for reconcentrating moist glycol. 4,314,891, Cl. 203-18.000.
Knop, Karl: *See*—
Steigmeier, Edgar F.; and Knop, Karl, 4,314,763, Cl. 356-237.000.
Kobayashi, Akio; and Katto, Takayuki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Antistatic resin composition. 4,315,081, Cl. 525-2.000.
Kobayashi, Kazuyuki: *See*—
Sumitomo, Hiroyuki; Doi, Masafumi; Kobayashi, Kazuyuki; Fukami, Katsutoshi; and Kawanishi, Kenzo, 4,314,605, Cl. 165-110.000.
Kobayashi, Shigeru: *See*—
Yamamura, Yuichi; Hasegawa, Akira; Azuma, Ichiro; and Kobayashi, Shigeru, 4,314,998, Cl. 424-177.000.
Kobayashi, Tsuneki; and Nakano, Hiroshige. Hammer drive safety device for printer. 4,315,297, Cl. 361-191.000.
Kobe Steel, Ltd.: *See*—
Nakako, Yukio; Ohzawa, Toshio; Yokota, Shizuo; and Tamura, Masaaki, 4,314,898, Cl. 208-8.0LE.
Sudo, Masatoshi; Higashi, Masanori; Ohki, Tsuguaki; and Kanbe, Shoji, 4,314,862, Cl. 148-12.00F.
Koch, Carl. Rear wall construction of a photographic cassette camera. 4,314,746, Cl. 354-23.00R.
Koch, Robert L., II: *See*—
Dunn, Howard E.; and Koch, Robert L., II, 4,314,906, Cl. 210-754.000.
Koehring GmbH: *See*—
Kuhn, Hans, 4,314,613, Cl. 173-131.000.
Koei Chemical Co., Ltd.: *See*—
Uede, Kazuo; Sumizaki, Tuguo; and Nakamura, Masatoshi, 4,314,914, Cl. 252-472.000.
Koeneman, James B., to Lord Corporation. Hip joint prosthesis. 4,314,381, Cl. 3-1.912.
Koenig, Herbert G., Jr.: *See*—
Allen, Louis B., Jr.; Koenig, Herbert G., Jr.; and Meyer, Danny D., 4,315,225, Cl. 372-35.000.
Koenig, Karl-Heinz; Feuerherd, Karl-Heinz; and Oeser, Heinz-Guenter, to BASF Aktiengesellschaft. Preparation of mixtures of 1-monohalogenated isocyanates and 1,2-unsaturated isocyanates. 4,314,948, Cl. 260-453.00P.
Kohnke, Hans-Jurgen: *See*—
Jansen, Harald; Oelert, Gerhard; and Kohnke, Hans-Jurgen, 4,314,668, Cl. 237-2.00B.
Koizumi, Yoshihito: *See*—
Fukuda, Tetsuro; Matsuura, Hideo; Koizumi, Yoshihito; and Yamaguchi, Takeshi, 4,315,041, Cl. 426-653.000.
Koken Co., Ltd.: *See*—
Miyata, Teruo; Akiyama, Taichiro; and Furuse, Masayasu, 4,314,380, Cl. 3-1.900.
Kokka Kogyo Kabushiki Kaisha: *See*—
Kurokawa, Masahito, 4,314,623, Cl. 188-267.000.
Kokubu, Sadao; and Endou, Nobuhiro, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Electrical switch device. 4,315,117, Cl. 200-61.270.
Kolesnikova, Nina I.: *See*—
Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Belokoskov, Valentin I.; and Plotnikov, Vladimir P., 4,314,975, Cl. 423-81.000.
Koller, Josef. Apparatus for the segregation of worn-out cleaning bodies. 4,314,604, Cl. 165-95.000.
Komoto, Shinsuke, to Asahi Kogaku Kogyo Kabushiki Kaisha. Lens mount barrel for photographing with flash lamp. 4,314,749, Cl. 354-139.000.
Kondo, Hiroatsu: *See*—
Yamada, Yasuaki; Ozawa, Toshiaki; and Kondo, Hiroatsu, 4,315,200, Cl. 318-603.000.
Kondo, Hisashi; Yamazaki, Shozo; and Yamada, Yukio, to Hitachi, Limited. High-speed circuit breaker. 4,315,231, Cl. 335-61.000.
Kondo, Kaneichi; and Shingu, Yuji, to Matsushita Electric Industrial Co., Ltd. High voltage piezoelectric generating device with lengthened spark time. 4,315,180, Cl. 310-319.000.
Kondo, Yoh-Ichi, to Kabushiki Kaisha Kawai Gakki Seisakusho. Automatic rhythm pattern accompaniment equipment. 4,314,493, Cl. 84-1.030.
Konijnendijk, Willem L.; Boogerd, Gert M.; and Tonnaer, Henricus L. M., to U.S. Philips Corporation. Luminescent material with alkaline earth metal silicate aluminate host lattice and low-pressure mercury vapor discharge lamp containing the same. 4,315,191, Cl. 313-486.000.
Konno, Toshio: *See*—
Yamamoto, Kaneo; Nakamura, Hiroshi; and Konno, Toshio, 4,315,273, Cl. 357-27.000.
Konomi, Toshiaki: *See*—
Motosugi, Katsuhiko; Takahashi, Hiroshi; Toyoda, Shuhei; Konomi, Toshiaki; and Matsui, Hideaki, 4,314,529, Cl. 123-52.0MB.
Konrad, Gunther: *See*—
Rose, David; Busch, Peter; Lieske, Edgar; and Konrad, Gunther, 4,314,809, Cl. 8-406.000.
Koon, Homer E., Jr., to Alpha Arms, Inc. Rifle magazine device. 4,314,419, Cl. 42-50.000.
Korpman, Ralf, to Permacel. Surgical drainage bags. 4,314,558, Cl. 128-283.000.
Kosic, Stjepan. Steering mechanism for boats. 4,314,520, Cl. 114-144.00R.
Kossiakoff, Alexander, to Johns Hopkins University, The. Graphical automatic programming. 4,315,315, Cl. 364-300.000.
Kosuzume, Hiroshi: *See*—
Mochida, Ei; Suzuki, Yasuo; Onishi, Haruo; and Kosuzume, Hiroshi, 4,315,003, Cl. 424-226.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Intichar, Lutz; and Weghaupt, Erich, 4,315,172, Cl. 310-53.000.
Queiser, Horst; Meichsner, Othmar; and Erbse, Dietmark, 4,314,877, Cl. 159-47.0WL.
Krainski, Theodore J., Jr., to Johnson & Johnson. Analog-digital control device. 4,314,482, Cl. 73-805.000.
Kramer, Manfred; Schmid, Werner; and Cramer, Hans-Dieter, to Robert Bosch GmbH. Electric centrifugal switch. 4,315,118, Cl. 200-80.00R.
Kramer, Wilhelm; and Grafling, Joachim, to BBC Brown, Boveri & Company, Ltd. Contact arrangement. 4,315,122, Cl. 200-248.000.
Kratzer, Hans: *See*—
Bonse, Gerhard; Blank, Heinz U.; and Kratzer, Hans, 4,315,094, Cl. 544-182.000.
Kreighbaum, William E.; and Comer, William T., to Mead Johnson & Company. Heterocyclic substituted aryloxy 3-indolyl-tertiary butylaminopropanols. 4,314,943, Cl. 260-326.13B.
Krembel, Frank, Jr., to Columbia Marking Tools, Inc. Rotary wheel type marking head. 4,314,505, Cl. 101-85.000.
Kremer, Lawrence N.; and Boehmer, Matthew A., to Diversey Corporation, The. Titanium etching solution. 4,314,876, Cl. 156-664.000.
Kreyenbuhl, Armand, to Adidas Fabrique De Chaussures De Sport. Binding for fastening a boot to a ski. 4,314,713, Cl. 280-615.000.

Krolzick, Gordon J.: *See*—
Cartier, Roger J.; and Krolzick, Gordon J., 4,314,409, Cl. 34-82.000.
Kronfeld, Leonard E., to Nortronics Company, Inc. Beveled magnetic heads for floppy disk. 4,315,292, Cl. 360-122.000.
Kruger, Hans-Rudolf; Arndt, Friedrich; Baumert, Dietrich; and Rusch, Reinhart, to Schering Aktiengesellschaft. 1,2,3-Thiadiazole-5-carboxylic acid amide derivatives, process for making the same and herbicidal growth regulating defoliating and fungicidal compositions containing same. 4,314,839, Cl. 71-73.000.
Krumme, Jens-Peter: *See*—
Schmelzer, Christoph; Spohr, Reimar; Krumme, Jens-Peter; Witter, Klaus; and Heitmann, Heinrich, 4,314,894, Cl. 204-192.00M.
Kub, Francis J.; White, Marvin H.; Mack, Ingham A. G.; and Lampe, Donald R., to Westinghouse Electric Corp. Bidirectional charge control circuit. 4,315,164, Cl. 307-221.00D.
Kubota Ltd.: *See*—
Murakami, Shinichi; Nishihara, Hisakatsu; Yoshimitsu, Arata; and Noji, Sueyoshi, 4,314,861, Cl. 148-12.00E.
Tsuji, Keiro, 4,314,619, Cl. 180-327.000.
Kud, Alexander: *See*—
Lehner, August; Kud, Alexander; and Hartmann, Heinrich, 4,314,922, Cl. 260-29.2TN.
Kuhl, Manfred: *See*—
Feller, Otto; Kuhl, Manfred; and Oepen, Heinz, 4,314,492, Cl. 82-18.000.
Kuhn, Hans, to Koehring GmbH. Pile-driving recoil damping device. 4,314,613, Cl. 173-131.000.
Kukreja, Jagmohan S., to Siemens Corporation. Apparatus for shifting the magnetic read/write head carriage in a floppy disk drive unit. 4,315,290, Cl. 360-106.000.
Kulicke and Soffa Industries Inc.: *See*—
Matcovich, Thomas J.; and Valenski, Dan, 4,315,128, Cl. 219-85.00D.
Kulik, Metro D., to Conoco Inc. Method for removing hydrogen sulfide and nitric oxide from gaseous mixtures. 4,314,977, Cl. 423-235.000.
Kumar, Jitendra: *See*—
Chang, Chuan C.; and Kumar, Jitendra, 4,314,855, Cl. 134-3.000.
Kunikane, Makoto; Umehara, Masaakira; Uji-Ie, Koji; and Taniguchi, Kiyoshi, to Ricoh Co., Ltd. Photo-sensitive and heat-sensitive composition and recording element using same. 4,315,068, Cl. 430-341.000.
Kuo, Chin-Tui. Multi-purpose sticks or canes. 4,314,575, Cl. 135-66.000.
Kupfer, Hanspeter, to Siemens-Albis Aktiengesellschaft. Method and apparatus for measuring the distance between a primary station and a secondary station. 4,315,260, Cl. 343-7.500.
Kuppers, Dieter, to U.S. Philips Corporation. Method of producing optical fibers. 4,314,833, Cl. 65-3.120.
Kuraray Co., Ltd.: *See*—
Mori, Fumio; Omura, Yoshiaki; Fujita, Yoshiji; Nishida, Takashi; Hosogai, Takeo; Wada, Fumio; Aihara, Sukeji; Tamai, Yoshin; and Itoi, Kazuo, 4,315,029, Cl. 424-304.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Kobayashi, Akio; and Katto, Takayuki, 4,315,081, Cl. 525-2.000.
Kurihara, Takashi: *See*—
Kamoshita, Akio; Matsumoto, Akihiko; and Kurihara, Takashi, 4,314,710, Cl. 280-96.000.
Kurokawa, Masahito, to Kokka Kogyo Kabushiki Kaisha. Vibration isolator. 4,314,623, Cl. 188-267.000.
Kurozumi, Seizi: *See*—
Noyori, Ryoji; Suzuki, Masaaki; and Kurozumi, Seizi, 4,315,032, Cl. 424-317.000.
Kuster & Co. GmbH: *See*—
Brauer, Gerhard; Adam, Peter; and Seuffert, Werner, 4,314,692, Cl. 254-362.000.
Kusubayashi, Tochiaki: *See*—
Hirakawa, Tadeshi; Kusubayashi, Tochiaki; and Oku, Yukio, 4,314,868, Cl. 156-207.000.
Kutney, John T., to General Electric Company. Drag-reducing component. 4,314,681, Cl. 244-54.000.
Kuwayama, Tetsuro; and Tanaka, Kazuo, to Canon Kabushiki Kaisha. Color image detecting device. 4,315,279, Cl. 358-44.000.
Kwasnik, Hans-Jurgen; and Piduch, Hans-Gunter, to Dr. C. Otto & Comp. GmbH. Charging car for coke ovens. 4,314,787, Cl. 414-163.000.
Kwasnik, Hans-Jurgen; and Piduch, Hans-Gunter, to Dr. C. Otto & Comp. G.m.b.H. Apparatus to extract charging gases from a coke oven chamber. 4,314,889, Cl. 202-241.000.
Kwon, Henry S. C.; and Jukkola, Walfred W., to Dorr-Oliver Incorporated. Fluidized bed reactor with vertical cooling coils. 4,314,967, Cl. 422-49.000.
Kyber Engineering, Inc.: *See*—
Marez, Alejandro; and Spykerman, Jon J., 4,315,304, Cl. 363-49.000.
Kyomasu, Ryuichi; Hanashima, Shuichi; and Suzumura, Yoshikazu, to Hitachi, Ltd. Control circuit for a positioning device using a d-c motor. 4,315,199, Cl. 318-601.000.
kyzy Mamedova, Svetlana G.: *See*—
ogly Shakhtakhtinsky, Togrul N.; ogly Rzaev, Zakir M.; kyzy Mamedova, Svetlana G.; ogly Dunyamaliev, Akhmed D.; ogly Salakhov, Mustafa S.; and ogly Guseinov, Mustafa M., 4,314,851, Cl. 106-16.000.
L.C.C.-C.I.C.E. Compagnie Europeenne de Composants Electroniques: *See*—
Saint Marcoux, Roland; and Fink, Leon, 4,315,299, Cl. 361-274.000.
La Salle Machine Tool, Inc.: *See*—
Shilander, Frank R.; and Kiss, Gyorgy, 4,314,629, Cl. 198-500.000.
Laauwe, Robert H. Viscous product dispensing squeeze bottle having a self-venting automatic shut-off valve. 4,314,658, Cl. 222-213.000.
Label-Aire: *See*—
Crankshaw, Michael, 4,314,869, Cl. 156-215.000.
Laboratoires Pharmascience: *See*—
Cerf, Olivier; Grenier, Georges; Hermier, Jean; and Rancurel, Alain, 4,314,965, Cl. 422-28.000.
Laciak, Francis M.: *See*—
Anderson, Richard D.; Fauchier, Jess F., II; and Laciak, Francis M., 4,314,757, Cl. 355-29.000.
LaFleur, Paul J., Jr.; and Crescenzo, Francis C., to Package Machinery Company. Stacking and packaging apparatus. 4,314,785, Cl. 414-46.000.
L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Pelloux-Gervais, Pierre, 4,314,450, Cl. 62-45.000.
Laker, Kenneth R.: *See*—
Fleischer, Paul E.; and Laker, Kenneth R., 4,315,227, Cl. 333-173.000.
Lambert, Hubert L. Extension connector. 4,314,771, Cl. 403-305.000.
Lambert, Stuart G., to Bexford Limited. Substrates suitable for the production of photopolymerizable elements. 4,315,066, Cl. 430-271.000.
Lampe, Donald R.: *See*—
Kub, Francis J.; White, Marvin H.; Mack, Ingham A. G.; and Lampe, Donald R., 4,315,164, Cl. 307-221.00D.
Land and Marine Engineering Limited: *See*—
Reynolds, John M.; Gibson, Colin E.; Seamans, John S.; and van der Steen, Anton R. F., 4,314,414, Cl. 37-54.000.
Lang, Gerard: *See*—
Jacquet, Bernard; Lang, Gerard; and Forestier, Serge, 4,314,808, Cl. 8-405.000.
Lapeyre, Guy; and Thiebaut, Jean, to Essilor International (Compagnie Generale d'Optique). Spectacle cleaning device for domestic use. 4,314,766, Cl. 366-101.000.
Laubie, Michel: *See*—
Malen, Charles; Roger, Pierre; and Laubie, Michel, 4,315,019, Cl. 424-272.000.
Malen, Charles E.; Roger, Pierre; and Laubie, Michel, 4,315,020, Cl. 424-272.000.
Lauterbach, Udo: *See*—
Berger, Fritz; Lauterbach, Udo; and Wetzel, Hermann, 4,314,867, Cl. 156-196.000.
Lauven, Walter, to Ford Motor Company. Hydraulic control valve system with a pressure regulator for a planetary gear transmission. 4,314,488, Cl. 74-869.000.
Lavanish, Jerome M., to PPG Industries, Inc. Herbicidal substituted 1,3,4-thiadiazol-2-yl-4-hydroxy-1-methyl-2-imidazolidinones. 4,314,842, Cl. 71-90.000.
Law, H. David: *See*—
Tomasetta, Louis R.; and Law, H. David, 4,314,858, Cl. 148-1.500.
Lawrason, F. Douglas. Method of treating menopausal symptoms. 4,315,033, Cl. 424-319.000.
Lawson, Daniel D.: *See*—
United States of America, National Aeronautics and Space Administration; Lawson, Daniel D.; and Petersen, Gene R., 4,314,984, Cl. 423-579.000.
Lazzari, Jean-Pierre, to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). Magnetic transduction device with magnetoresistances. 4,315,291, Cl. 360-113.000.
Leach Industries: *See*—
Bayer, Raymond M.; and Rodgers, Robert E., 4,314,699, Cl. 273-73.00D.
Leclerc, Bernard: *See*—
Bert, Alain; Leclerc, Bernard; and Archambault, Yves, 4,315,275, Cl. 357-56.000.
Lederman, Warren A., to Johnson Controls, Inc. Fluid signal transmitting apparatus. 4,314,578, Cl. 137-84.000.
Ledford, Edward B., Jr., to University of Nebraska, The Board of Regents of the. Mass spectrometer. 4,315,149, Cl. 250-282.000.
Lee, Gim F., Jr.: *See*—
Cooper, Glenn D.; Lee, Gim F., Jr.; and Shufelt, Rainey A., 4,315,084, Cl. 525-69.000.
Lee, Hong H., to Westvaco Corporation. Method of operating a paper-machine drying line. 4,314,878, Cl. 162-198.000.
Lee, James Y.: *See*—
McKee, Joseph E.; and Lee, James Y., 4,315,259, Cl. 340-799.000.
Lee, Peter F. Biopsy and aspiration needle unit. 4,314,565, Cl. 128-753.000.
Lee, Raymond: *See*—
Gagliani, John; and Lee, Raymond, 4,315,076, Cl. 521-77.000.
Gagliani, John; and Lee, Raymond, 4,315,077, Cl. 521-77.000.
Gagliani, John; and Lee, Raymond, 4,315,080, Cl. 521-189.000.
Leeds & Northrup Company: *See*—
Walsh, Thomas J., 4,315,211, Cl. 324-123.00R.
Leeds, Richard L.; Montross, Jeffrey A.; and Barbini, Richard J., to Airco, Inc. Controlling temperature of a cryogenically refrigerated product. 4,314,451, Cl. 62-68.000.
Lefever, Lawrence R.: *See*—
Fisher, Robert J.; and Lefever, Lawrence R., 4,315,113, Cl. 200-5.00R.
Lehner, August; Kud, Alexander; and Hartmann, Heinrich, to BASF Aktiengesellschaft. Process for the preparation of aqueous polyurethane dispersions. 4,314,922, Cl. 260-29.2TN.

Leibhard, Erich; Schiefer, Erwin; and Stirnweiss, Peter, to Hilti Aktiengesellschaft. Sealing member for a device for melting solid adhesive material. 4,314,655, Cl. 222-146.0HE.

Leiby, Clare C.: *See*—
Ezekiel, Shaoul; Leiby, Clare C.; Picard, Richard H.; Willis, Charles R.; and Hackel, Richard P., 4,315,224, Cl. 331-3.000.

Leitheiser, Melvin A.; and Sowman, Harold G., to Minnesota Mining and Manufacturing Company. Non-fused aluminum oxide-based abrasive mineral. 4,314,827, Cl. 51-298.000.

Leman, A. Louis, Jr., to Southwest Oilfield Products, Inc. Gate valve. 4,314,688, Cl. 251-191.000.

Lemmer, Alfred. Device for assembling printed circuit boards. 4,314,402, Cl. 29-721.000.

Lemoine, Maurice G.; and Pasdera, Leonard A., to Ampex Corporation. Apparatus for providing drop-out compensation in recording and reproducing systems. 4,315,331, Cl. 371-31.000.

Leo Pharmaceutical products Ltd. A/S: *See*—
von Daehne, Welf; and Rasmussen, Poul R., 4,315,004, Cl. 424-238.000.

Leoni, Roberto; Baldini, Alberto; Calloni, Angelo; and Angelini, Gianfranco, to SNIA Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Process for the preparation of regenerated cellulose formed bodies from solutions of cellulose derivatives in organic solvents. 4,314,959, Cl. 264-187.000.

Lestraden, Jakobus W. Ground heating system. 4,314,772, Cl. 404-27.000.

Levati, Renzo, to R. Levati S.p.A. Process for peeling tomatoes under vacuum. 4,315,039, Cl. 426-482.000.

Lever Brothers Company: *See*—
Knight, Peter C., 4,314,953, Cl. 264-13.000.

Levin, Harry: *See*—
Hsu, George C.; Levin, Harry; Hogle, Richard A.; Praturi, Ananda; and Lutwack, Ralph, 4,314,525, Cl. 118-716.000.

Levine, Marc A. Anti-theft control and method. 4,315,160, Cl. 307-10.0AT.

Levine, Michael R. Electronic thermostat. 4,314,665, Cl. 236-46.00R.

Levinson, Arthur A.; and Basa, Kenneth B., to National Can Corporation. Vegetable protein product and process. 4,315,034, Cl. 426-104.000.

Levy, Moshe: *See*—
Hoffend, Thomas R.; and Levy, Moshe, 4,314,931, Cl. 260-42.530.

Lewarchik, Ronald J.: *See*—
Birkmeyer, William J.; Lewarchik, Ronald J.; Klanic., Joseph A.; and Anderson, Carl C., 4,314,918, Cl. 260-20.000.

Lewis, Leon D. Turbine engine thrust booster. 4,314,445, Cl. 60-204.000.

Leybold Heraeus GmbH: *See*—
Redel, Karl-Georg; and Deppisch, Gerd, 4,315,195, Cl. 315-107.000.

Libby, Donald R.; and Chen, Sung J., to Chemineer, Inc. Solvent extraction method using static mixers. 4,314,974, Cl. 423-8.000.

Liddell, Peter R.; Pearl, Antony S., deseceased; and by Calvert, Edmund, administrator, to Varian Tectron Party Ltd. Chemical analysis sample control. 4,314,764, Cl. 356-315.000.

Lieske, Edgar: *See*—
Rose, David; Busch, Peter; Lieske, Edgar; and Konrad, Gunther, 4,314,809, Cl. 8-406.000.

Liggins, Allan: *See*—
Haslbeck, Joseph; and Liggins, Allan, 4,315,100, Cl. 174-51.000.

Lin, Frank W.; and Sze, Mei S., to Qume Corporation. Digital servo system. 4,315,198, Cl. 318-594.000.

Lindig, Otto: *See*—
Sack, Werner; and Lindig, Otto, 4,315,054, Cl. 428-433.000.

Lindquist, William W. Extension boom for tractors having back hoe attachments. 4,314,622, Cl. 182-2.000.

Linhart, Friedrich; Zeeh, Bernd; and Adolphi, Heinrich, to BASF Aktiengesellschaft. Triazole derivatives. 4,315,017, Cl. 424-269.000.

Lining, Kurt: *See*—
Cerny, Daryl D.; and Lining, Kurt, 4,315,188, Cl. 313-269.000.

Lipsitz, Barry R.; and Dolinar, Kevin O. Sound producing toy. 4,314,423, Cl. 46-232.000.

Litton Industrial Products, Inc.: *See*—
Bricker, Robert E.; and Humpleby, Paul J., 4,314,425, Cl. 51-267.000.

Liu, Richard T.: *See*—
Husaini, Saeed A.; and Liu, Richard T., 4,315,036, Cl. 426-387.000.

Lloyd, William A.; and Thornburg, David D., to Xerox Corporation. Backup electrode for an electrostatic recorder. 4,315,270, Cl. 346-155.000.

Lockheed Corporation: *See*—
Webber, Robert C., 4,314,866, Cl. 156-163.000.

Locklin, David W.: *See*—
Putnam, Abbott A.; and Locklin, David W., 4,314,444, Cl. 60-39.770.

Loeffler, Earl F.; and Weyand, Harley P., Jr., to Firestone Tire & Rubber Company, The. Method and apparatus for building a tire. 4,314,864, Cl. 156-111.000.

Loffler, Walter, to Hollingsworth GmbH. Dirt separator. 4,314,387, Cl. 19-98.000.

Logan, Emanuel L., Jr., to Reliable Security Systems, Inc. Timing apparatus for delaying opening of doors. 4,314,722, Cl. 292-263.000.

Logsdon, Daniel D., to Logsdon Foundation, The. Sound isolating device for suspending plumbing pipes. 4,314,687, Cl. 248-610.000.

Logsdon Foundation, The: *See*—
Logsdon, Daniel D., 4,314,687, Cl. 248-610.000.

Lohmann, Joachim W.: *See*—
Ranz, Erwin; Lohmann, Joachim W.; and Schutz, Heinz-Dieter, 4,315,070, Cl. 430-505.000.

Longi, Paolo: *See*—
Giannini, Umberto; Longi, Paolo; Deluca, Domenico; and Pricca, Angelo, 4,314,911, Cl. 252-429.00A.

Lord Corporation: *See*—
Koeneman, James B., 4,314,381, Cl. 3-1.912.

L'Oreal: *See*—
Fourcadier, Chantal; and Grollier, Jean F., 4,314,810, Cl. 8-410.000.
Grollier, Jean-Francois; Monnais, Christian; and Peritz, Lyonnel, 4,314,807, Cl. 8-406.000.
Jacquet, Bernard; Lang, Gerard; and Forestier, Serge, 4,314,808, Cl. 8-405.000.

Lorsch, Johannes. Diapositive frames. 4,314,416, Cl. 40-152.000.

Losert, Wolfgang: *See*—
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Mannesmann, Gerda; Losert, Wolfgang; and Casals, Jorge, 4,315,013, Cl. 424-263.000.

Love, Thomas L., to ICI Australia Limited. Device with incendiary fusecord ignited by detonation. 4,314,508, Cl. 102-275.700.

Loveless, James F.: *See*—
Owen, Edward E.; and Loveless, James F., 4,314,712, Cl. 280-404.000.

Lovhaugen, Odd: *See*—
Mehlum, Even; and Lovhaugen, Odd, 4,314,739, Cl. 350-3.660.

Loving, James A., to Baxter Travenol Laboratories, Inc. Vascular stabilizer. 4,314,568, Cl. 128-327.000.

Lowery, Kirby, Jr.; Knight, George W.; and May, James A., Jr., to Dow Chemical Company, The. High efficiency, high temperature catalyst for polymerizing olefins. 4,314,912, Cl. 252-429.00B.

Lueg, Heinz; Blackert, Hanno; Wimmenauer, Dirk; and Hermanns, Winfried, to Hermanns, Winfried. Device for determining the moment when competitors in a race are passing the finishing line. 4,315,242, Cl. 340-38.00L.

Luhleich, Hartmut; and Dias, Francisco J., to Kernforschungsanlage Julich, Gesellschaft mit beschrankter Haftung. Process for making a starting material for the manufacture of artificial graphite articles. 4,314,599, Cl. 164-16.000.

Luigi, Accossato. Equipment for lateral excavation. 4,314,789, Cl. 414-694.000.

Lukach, Danil, to USM Corporation. Metal extrusion press-billet loader. 4,314,471, Cl. 72-270.000.

Lundberg, Hans G., to Trelleborg Marin Aktiebolag. Method and apparatus in the treatment of underwater surfaces of fixed or floating constructions. 4,314,521, Cl. 114-222.000.

Lutwack, Ralph: *See*—
Hsu, George C.; Levin, Harry; Hogle, Richard A.; Praturi, Ananda; and Lutwack, Ralph, 4,314,525, Cl. 118-716.000.

Lux, William J.: *See*—
Ginsburg, Milton; and Lux, William J., 4,314,382, Cl. 4-236.000.

Lyall Electric, Inc.: *See*—
Hass, Alan R., 4,314,960, Cl. 264-276.000.

Lynch, Patrick E., Jr.: *See*—
Wimsatt, James M.; and Lynch, Patrick E., Jr., 4,314,385, Cl. 15-321.000.

M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Vollhardt, Frohmut, 4,314,826, Cl. 48-77.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Rees, Werner, 4,314,506, Cl. 101-365.000.

Ma, Austin C. Emergency syringe. 4,314,556, Cl. 128-218.0DA.

MacBean, Donald G.: *See*—
Buchanan, John G.; and MacBean, Donald G., 4,314,589, Cl. 139-383.00A.

Machines Dubuit: *See*—
Combeau, Guy, 4,314,504, Cl. 101-41.000.

Mack, Ingham A. G.: *See*—
Kub, Francis J.; White, Marvin H.; Mack, Ingham A. G.; and Lampe, Donald R., 4,315,164, Cl. 307-221.00D.

MacLean-Fogg Company: *See*—
Parnell, Lyle J.; and Fabio, James L., 4,314,783, Cl. 410-34.000.

MacLean, Torry F. Crushing and pulverizing apparatus. 4,314,676, Cl. 241-169.000.

Macleod, Kenneth S.; and Fink, Gary, to Phillips Petroleum Company. Plastic pipe extrusion. 4,314,958, Cl. 264-167.000.

Madewell, Tommy J.; and Jezek, Ben F., Jr., to Victor Equipment Co. Beveling tip. 4,314,672, Cl. 239-424.000.

Madsen, James B.; and Brown, Daniel R., to International Minerals & Chemical Corporation. Particulate filter method. 4,314,829, Cl. 55-98.000.

Magnetic Pheripherals, Inc.: *See*—
Milford, Richard E., 4,315,246, Cl. 340-146.30D.

Maguire, Eileen: *See*—
Dillard, David A.; Maguire, Eileen; and Donovan, Lawrence P., 4,315,045, Cl. 427-307.000.

Mahoney, John J., Jr., to Du Pont de Nemours, E. I., and Company. Mineral reinforced polyamides. 4,314,929, Cl. 260-42.150.

Makizono, Masataka: *See*—
Yunoki, Shigeto; and Makizono, Masataka, 4,314,519, Cl. 114-125.000.

Malen, Charles; Roger, Pierre; and Laubie, Michel, to Science Union et Cie. Novel aryltrifluoroethylamines and processes for producing the same. 4,315,019, Cl. 424-272.000.

Malen, Charles E.; Roger, Pierre; and Laubie, Michel, to Science Union et Cie. Oxazoline (trifluoroethyl) amine. 4,315,020, Cl. 424-272.000.

Manizza, Guelfo A., to Federal Paper Board Company, Inc. Bottle package. 4,314,640, Cl. 206-434.000.

Mannesmann, Gerda: *See—*
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Mannesmann, Gerda; Losert, Wolfgang; and Casals, Jorge, 4,315,013, Cl. 424-263.000.

Manoury, Philippe M., to Synthelabo. 4-Amino-6,7-dimethoxyquinazol-2-yl alkylenediamines. 4,315,007, Cl. 424-251.000.

Mansfield, Vaughn: *See—*
Haley, Jack R.; Smith, Jimmy B.; and Mansfield, Vaughn, 4,314,887, Cl. 202-91.000.

Marathon Oil Company: *See—*
Johnson, Irvin D., 4,314,476, Cl. 73-155.000.

Marez, Alejandro; and Spykerman, Jon J., to Kyber Engineering, Inc. Starting circuit for a high frequency magnetic amplifier power supply. 4,315,304, Cl. 363-49.000.

Markem Corporation: *See—*
Perra, Andrew G., Jr.; and Sparhawk, George H., Jr., 4,314,503, Cl. 101-41.000.

Marra, Dorothea C.: *See—*
Spitzer, J. George; Marra, Dorothea C.; Osipow, Lloyd I.; and Claffey, Kevin, 4,314,573, Cl. 132-7.000.

Marsden, Barbara B.: *See—*
Marsden, Floyd, 4,314,518, Cl. 114-39.000.

Marsden, Floyd, to Marsden, Barbara B. Simplified sailing system. 4,314,518, Cl. 114-39.000.

Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, to Roussel Uclaf. 3-Tetrahaloethyl-cyclopropane-1-carboxylate esters. 4,315,012, Cl. 424-263.000.

Martin, Johannes J.; and Martin, Walter J., to Josef Martin Feuerungsbau GmbH, Firma. Grate bar for grate linings, especially in furnaces. 4,314,541, Cl. 126-163.00R.

Martin, Robert R.: *See—*
Easthope, Thomas C.; and Martin, Robert R., 4,314,386, Cl. 17-51.000.

Martin, Walter J.: *See—*
Martin, Johannes J.; and Martin, Walter J., 4,314,541, Cl. 126-163.00R.

Maruhashi, Shigeaki; Hasegawa, Morihiro; and Yamauchi, Takashi, to Nisshin Steel Company, Ltd. Process for dephosphorization and denitrification of chromium-containing iron. 4,314,847, Cl. 75-51.000.

Maruoka, Toshiyuki: *See—*
Hata, Kosei; Hata, Tadayo; and Maruoka, Toshiyuki, 4,314,995, Cl. 424-93.000.

Maruyama, Takashi: *See—*
Ueno, Katsuji; and Maruyama, Takashi, 4,315,086, Cl. 525-391.000.

Marz, Helmut. Fold-flat. 4,314,686, Cl. 248-346.000.

Masaaki, Ono: *See—*
Wakatsuki, Noboru; and Masaaki, Ono, 4,314,393, Cl. 29-25.350.

Masaki, Yasuzi. Flock transfer sheet and flock transfer printing process. 4,314,813, Cl. 8-468.000.

Mase, Akira: *See—*
Mori, Kazumasa; Asahi, Taro; Banzai, Keiichiro; Iwaki, Katsutaro; Muto, Katsuya; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,315,205, Cl. 322-99.000.

Mashiko, Yoji: *See—*
Abe, Haruhiko; Mashiko, Yoji; Harada, Hiroshi; Asai, Sotoju; Mizuguchi, Kazuo; and Nomoto, Sumio, 4,314,874, Cl. 156-628.000.

Masino, Fred S.: *See—*
Reisman, Elias; Goodsell, David S.; and Masino, Fred S., 4,314,449, Cl. 62-3.000.

Masuda, Shunichi: *See—*
Shimizu, Katsuichi; Sawamura, Osamu; Masuda, Shunichi; Tomosada, Masahiro; and Sakamaki, Hisashi, 4,314,754, Cl. 355-14.00C.

Matcovich, Thomas J.; and Valenski, Dan, to Kulicke and Soffa Industries Inc. Electrically heated bonding tool for the manufacture of semiconductor devices. 4,315,128, Cl. 219-85.00D.

Matsuda, Akio: *See—*
Tsuji, Yoshiomi; Matsuda, Akio; Ikeda, Tamaki; and Mori, Kenji, 4,314,774, Cl. 405-115.000.

Matsufuji, Akira: *See—*
Kitamura, Takashi; Sumi, Yoshiro; and Matsufuji, Akira, 4,314,469, Cl. 72-221.000.

Matsui, Hideaki: *See—*
Motosugi, Katsuhiko; Takahashi, Hiroshi; Toyoda, Shuhei; Konomi, Toshiaki; and Matsui, Hideaki, 4,314,529, Cl. 123-52.0MB.

Matsumoto, Akihiko: *See—*
Kamoshita, Akio; Matsumoto, Akihiko; and Kurihara, Takashi, 4,314,710, Cl. 280-96.000.

Matsumoto, Seiji: *See—*
Kato, Hisatoyo; Ishida, Masamitsu; and Matsumoto, Seiji, 4,315,318, Cl. 364-515.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Ishida, Toshimichi; Takayanagi, Takeo; and Taki, Yasuo, 4,314,870, Cl. 156-272.000.
Kondo, Kaneichi; and Shingu, Yuji, 4,315,180, Cl. 310-319.000.
Sekido, Satoshi; and Ariga, Kozo, 4,314,996, Cl. 422-98.000.
Sonoda, Nobuo; Shimotsuma, Wataru; Kishimoto, Yoshio; and Sekine, Yoichi, 4,315,267, Cl. 346-1.100.
Todoroki, Tsunehiko; and Hirohata, Hyogo, 4,314,848, Cl. 75-173.00C.
Yamashita, Sadahiko; Onishi, Hiroshi; Saito, Mitsuo; and Sagawa, Morikazu, 4,315,333, Cl. 455-189.000.

Matsushita, Yoshiaki: *See—*
Yamamoto, Kazuhiko; Matsushita, Yoshiaki; Kanamori, Masaru; Nagasawa, Kazutoshi; Yoshihiro, Naotsugu; and Kishino, Seigo, 4,314,595, Cl. 148-1.500.

Matsuura, Hideo: *See—*
Fukuda, Tetsuro; Matsuura, Hideo; Koizumi, Yoshihito; and Yamaguchi, Takeshi, 4,315,041, Cl. 426-653.000.

Matsuzaki, Kiyoto; Seki, Shojiro; and Aya, Norimoto, to Nissan Motor Company, Limited. Heating filament arrangement for uniformly electrically heating a vehicular wrap-around type rear window-screen. 4,315,134, Cl. 219-203.000.

Maurer, Fritz; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. Combating pests with O-ethyl-S-n-propyl-O-(1-substituted-pyrazol-4-yl)-(thiono)-thiolphosphoric acid esters. 4,315,008, Cl. 424-200.000.

Maurer, Robert, to BASF Aktiengesellschaft. Solid pharmaceutical or diagnostic agent containing dextran and its preparation. 4,315,002, Cl. 424-181.000.

May, James A., Jr.: *See—*
Lowery, Kirby, Jr.; Knight, George W.; and May, James A., Jr., 4,314,912, Cl. 252-429.00B.

Mayfield, Alfred B. Linked torsional misalignment coupling. 4,314,460, Cl. 64-19.000.

McColl, James R.: *See—*
Peters, Thomas E.; and McColl, James R., 4,315,190, Cl. 313-467.000.

McCombie, Stuart W., to Schering Corporation. Deprotection of allylic esters, carbonates and carbamates catalyzed by palladium compounds. 4,314,942, Cl. 260-245.20R.

McCormick, Jon, to Fansteel Inc. Stainless steel castings. 4,314,863, Cl. 148-37.000.

McDonnell Douglas Corporation: *See—*
Allen, Louis B., Jr.; Koenig, Herbert G., Jr.; and Meyer, Danny D., 4,315,225, Cl. 372-35.000.
Solomon, Allen L., 4,315,097, Cl. 136-255.000.

McElroy, John M.; and Darrow, John O. G., to American Standard Inc. Regulated power supply having its d.c. voltage source selectively supplemented by a d.c. to d.c. converter. 4,315,208, Cl. 323-303.000.

McGee, Charles W. Universal self help aid apparatus for invalids. 4,314,576, Cl. 135-67.000.

McGuire, Joseph C.; and Brehm, William F., to United States of America, Energy. Hydrogen permeation resistant barrier. 4,314,880, Cl. 376-146.000.

McHugh, William T.: *See—*
Goebel, Franz; and McHugh, William T., 4,315,060, Cl. 429-122.000.

McKee, Joseph E.; and Lee, James Y., to Burroughs Corporation. System for operating a display panel having memory. 4,315,259, Cl. 340-799.000.

McKnight, Eugene A. Laundry process and method for treating textiles. 4,314,805, Cl. 8-137.000.

McKnight, William H.; Stotts, Larry B.; and Monahan, Michael A., to United States of America, Navy. Transmissive and reflective liquid crystal display. 4,315,258, Cl. 340-784.000.

McMullen, Charles H.; Nelson, James R.; Ream, Bernard C.; and Sims, Joseph A., Jr., to Union Carbide Corporation. Alkylene carbonate process. 4,314,945, Cl. 260-340.200.

McNab Incorporated: *See—*
Binder, Ira; and Teass, Horace A., Jr., 4,314,896, Cl. 204-195.00R.

McNeill, Janet L.: *See—*
Rich, William E., Jr.; Smith, Frank C.; and McNeill, Janet L., 4,314,823, Cl. 23-230.00R.

McPhee, William A.; and Golian, Timothy G., to Dresser Industries, Inc. Method and apparatus for disarming and arming explosive oil well perforators. 4,314,614, Cl. 175-4.560.

McStravick, Terence C.; and Sipkes, Peter, to N.V. Optische Industrie "De Oude Delft". Vacuum-tight, electrical connection for the photocathode in an image intensifier tube. 4,315,185, Cl. 313-102.000.

Mead Corporation, The: *See—*
Gaiser, William R.; Crutchfield, E. Bryant; and Bartley, Harold D., 4,314,651, Cl. 220-326.000.
Oliff, James R., 4,314,633, Cl. 206-148.000.
Spamer, William S., 4,314,648, Cl. 211-49.00D.

Mead Johnson & Company: *See—*
Kreighbaum, William E.; and Comer, William T., 4,314,943, Cl. 260-326.13B.

Mecom Standard Limited: *See—*
Bud, Hans; and Alway, Peter, 4,315,144, Cl. 235-92.00C.

Mede, John J., to Titanium Metals Corporation of America. Ring damped composite transit wheel. 4,314,725, Cl. 295-11.000.

Medtronic, Inc.: *See—*
Ware, Lyle A., 4,314,562, Cl. 128-419.00P.

Meerman, Wilhelmus C. P. M.: *See—*
Feenstra, Johannes; Klop, Marius A. F.; Meerman, Wilhelmus C. P. M.; Peelen, Jan G. J.; and Tuin, Hermanus N., 4,314,834, Cl. 65-11.100.

Mehlum, Even; and Lovhaugen, Odd, to Sentralinstitutt for industriell forskning. Holographic method for conversion of waves. 4,314,739, Cl. 350-3.660.

Mehren, Rainer: *See—*
Haubennestel, Karlheinz; and Mehren, Rainer, 4,314,924, Cl. 260-30.60R.

Meichsner, Othmar: *See—*
Queiser, Horst; Meichsner, Othmar; and Erbse, Dietmark, 4,314,877, Cl. 159-47.0WL.

Meisberger, Raymond F. Utility line support structure. 4,314,434, Cl. 52-721.000.

Merak S.p.A.: *See*—
Beghelli, Benito; De Angelis, Vincenzo; and Navone, Mauro, 4,315,048, Cl. 428-78.000.

Mercier L'Abbe, Guy: *See*—
Etienne, Claude; Fardouet, Claude; and Mercier L'Abbe, Guy, 4,314,882, Cl. 376-235.000.

Merrell Toraude et Compagnie: *See*—
Bey, Philippe; and Jung, Michel, 4,315,095, Cl. 548-344.000.

Merritt, Elisha B., to Diagnostic Information, Inc. Support structure for high voltage substrate. 4,315,183, Cl. 313-94.000.

Mesny, Jacques: *See*—
Ducol, Jean-Paul; Mesny, Jacques; and Warret, Julien, 4,314,462, Cl. 66-152.000.

Metelkin, Alexandr I.: *See*—
Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Belokoskov, Valentin I.; and Plotnikov, Vladimir P., 4,314,975, Cl. 423-81.000.

Metz, Paul, to Arbed S.A. Method of and device for shipping hot metal goods. 4,314,790, Cl. 414-786.000.

Metzeler Schaum GmbH: *See*—
Berger, Fritz; Lauterbach, Udo; and Wetzel, Hermann, 4,314,867, Cl. 156-196.000.

Metzger, Allan L.: *See*—
Morris, Robert I.; Metzger, Allan L.; and Weiss, Arnold S., 4,314,987, Cl. 424-1.000.

Meyer, Danny D.: *See*—
Allen, Louis B., Jr.; Koenig, Herbert G., Jr.; and Meyer, Danny D., 4,315,225, Cl. 372-35.000.

Meyer, Hans R.: *See*—
Weber, Kurt; and Meyer, Hans R., 4,314,820, Cl. 8-648.000.

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Michel, Thomas J.; and Clarke, Robert, to Santek, Inc. Bridge-balancing system for measuring extremely low currents. 4,315,210, Cl. 324-57.00R.

Middleman, Lee M.; and Gotcher, Alan J., to Raychem Corporation. PTC Devices comprising oxygen barrier layers. 4,315,237, Cl. 338-22.00R.

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Mikaelian, Iridy I.: *See*—
Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Belokoskov, Valentin I.; and Plotnikov, Vladimir P., 4,314,975, Cl. 423-81.000.

Milani, Luigi. Dispenser of hot beverages prepared from water soluble extracts. 4,314,767, Cl. 366-148.000.

Milford, Richard E., to Magnetic Pheripherals, Inc. Document character recognition system for identifying magnetic ink characters on bank checks and the like. 4,315,246, Cl. 340-146.30D.

Millen, Edward G., to Thiokol Corporation. Polysulfide rubbers suitable for hot application. 4,314,920, Cl. 260-24.000.

Miller, Arthur, to RCA Corporation. Array positioning system. 4,314,546, Cl. 126-425.000.

Miller, Herman P., III. Narrow band transmission system and method. 4,315,105, Cl. 179-15.55R.

Mills, Edwin R.; and Elmore, Ernest L., to Fieldcrest Mills, Inc. Electrical heating apparatus with overheating protection. 4,315,141, Cl. 219-505.000.

Mills, Howard: *See*—
Bettle, Griscom, III; Mills, Howard; and Richter, Edward B., 4,314,949, Cl. 260-502.00R.

Minnesota Mining and Manufacturing Company: *See*—
Leitheiser, Melvin A.; and Sowman, Harold G., 4,314,827, Cl. 51-298.000.
Rice, Thomas K., 4,314,821, Cl. 23-230.00B.
Seabold, Thomas W.; Patterson, Richard A.; and de Neui, Richard P., 4,315,047, Cl. 428-64.000.

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Fish, Aaron M.; Schlessel, Joseph H.; and Minski, Seymour B., 4,314,780, Cl. 409-81.000.

Misumi, Teruo: *See*—
Fukuda, Tadaji; and Misumi, Teruo, 4,315,063, Cl. 430-65.000.

Mita Industrial Company Limited: *See*—
Miyakawa, Nobuhiro; and Teshima, Takashi, 4,315,064, Cl. 430-122.000.

Mitel Corporation: *See*—
Aitken, Alan, 4,314,857, Cl. 148-1.500.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Abe, Haruhiko; Mashiko, Yoji; Harada, Hiroshi; Asai, Sotoju; Mizuguchi, Kazuo; and Nomoto, Sumio, 4,314,874, Cl. 156-628.000.
Sendo, Masaaki; and Suzuki, Kinzo, 4,315,176, Cl. 310-83.000.
Tokugawa, Fumitake; and Hatabe, Etsuo, 4,315,135, Cl. 219-216.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Hirakawa, Tadeshi; Kusubayashi, Tochiaki; and Oku, Yukio, 4,314,868, Cl. 156-207.000.

Mitsubishi Petrochemical Co., Ltd.: *See*—
Kitagawa, Sadao; Okada, Isao; and Saito, Teruo, 4,315,088, Cl. 526-125.000.

Mitsui Mining & Smelting Co., Ltd.: *See*—
Kasahara, Nobuyoshi; and Nonomura, Koutarou, 4,314,859, Cl. 148-6.100.

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Miyamoto, Noriaki; Shiraki, Masao; and Mitsuya, Kinpei, 4,314,438, Cl. 57-58.890.

Miwa, Yoshiyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Electric rice cooker. 4,315,138, Cl. 219-441.000.

Miwa, Yoshiyuki: *See*—
Onishi, Masayuki; and Miwa, Yoshiyuki, 4,315,139, Cl. 219-441.000.

Miyahara, Sadayasu: *See*—
Wakimoto, Saburo; Miyahara, Sadayasu; and Hyosu, Yoshihiko, 4,314,932, Cl. 260-42.530.

Miyakawa, Nobuhiro; and Teshima, Takashi, to Mita Industrial Company Limited. Electrostatic photographic copying process. 4,315,064, Cl. 430-122.000.

Miyamori, Tamotsu; Kaji, Hisatsugu; Kameyama, Iwao; and Takahashi, Michio, to Jureha Kagaku Kogyo Kabushiki Kaisha. Method for preparing carbon fibers. 4,314,981, Cl. 423-447.700.

Miyamoto, Noriaki; Shiraki, Masao; and Mitsuya, Kinpei, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Spinning unit for open-end spinning machine. 4,314,438, Cl. 57-58.890.

Miyata, Teruo; Akiyama, Taichiro; and Furuse, Masayasu, to Koken Co., Ltd. Artificial bone. 4,314,380, Cl. 3-1.900.

Mizuguchi, Kazuo: *See*—
Abe, Haruhiko; Mashiko, Yoji; Harada, Hiroshi; Asai, Sotoju; Mizuguchi, Kazuo; and Nomoto, Sumio, 4,314,874, Cl. 156-628.000.

Mizutani, Hideo: *See*—
Tokunaga, Michio; Okada, Ryoichi; Mizutani, Hideo; Hasegawa, Koichi; and Osaki, Takaaki, 4,315,206, Cl. 323-265.000.

Mizutani, Shigeaki: *See*—
Okabe, Tohru; Mizutani, Shigeaki; and Hayashi, Saburo, 4,314,803, Cl. 8-94.260.

Mlynarik, Jan; Novak, Josef; and Gregor, Jiri, to Skoda, oborovny podnik, Plzen. Hydraulic apparatus for the generation of large tensile forces. 4,314,690, Cl. 254-29.00A.

Mobay Chemical Corporation: *See*—
Tullio, Victor, 4,314,816, Cl. 8-527.000.

Mochida, Ei; Suzuki, Yasuo; Onishi, Haruo; and Kosuzume, Hiroshi, to Mochida Seiyaku Kabushiki Kaisha. Compositions containing azo compounds and use thereof for therapeutic treatment. 4,315,003, Cl. 424-226.000.

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Model, Ernst, to Ciba-Geigy Corporation. Iminoisoindolinone pigments containing phenylazoacetoacetyl-aminophenylene groups. 4,314,938, Cl. 260-165.000.

Moens, Joris, to N.V. Bekaert S.A. Process of mixing reinforcing elements with castable material. 4,314,853, Cl. 106-99.000.

Moffatt, William G.: *See*—
Hamilton, William C.; Moffatt, William G.; and Pagnotta, Gasper, 4,315,175, Cl. 310-71.000.

Moller, Dieter: *See*—
Poth, Ulrich; Moller, Dieter; and Dobbelstein, Arnold, 4,315,053, Cl. 428-423.700.

Mollet, Hans, to Ciba-Geigy Corporation. Process for the production of dyestuff preparations. 4,314,815, Cl. 8-524.000.

Molson Companies Limited, The: *See*—
Townsley, Phillip M.; and Weaver, Robert L., 4,315,038, Cl. 426-430.000.

Monahan, Michael A.: *See*—
McKnight, William H.; Stotts, Larry B.; and Monahan, Michael A., 4,315,258, Cl. 340-784.000.

Monier Colourtile Pty. Ltd.: *See*—
Hulcombe, Barry J., 4,314,433, Cl. 52-521.000.

Monnais, Christian: *See*—
Grollier, Jean-Francois; Monnais, Christian; and Peritz, Lyonnel, 4,314,807, Cl. 8-406.000.

Monsanto Company: *See*—
Burk, Raymond D., 4,315,083, Cl. 525-53.000.
Crutchfield, Marvin M.; Papanu, Victor D.; and Warren, Craig B., 4,315,092, Cl. 528-230.000.

Monsheimer, Rolf; Pfleiderer, Ernst; Siol, Werner; Boessler, Hanns; and Trabitzsch, Hans, to Rohm GmbH. Method for treating pelts and leather. 4,314,800, Cl. 8-94.10R.

Monsheimer, Rolf; and Pfleiderer, Ernst, to Rohm GmbH. Soaking method. 4,314,801, Cl. 8-94.140.

Monte, Charles S.; and Johnson, Wayne S., to Beckman Instruments, Inc. Electrophoretic gel container. 4,314,897, Cl. 204-299.00R.

Montecatini Edison S.p.A.: *See*—
Giannini, Umberto; Longi, Paolo; Deluca, Domenico; and Pricca, Angelo, 4,314,911, Cl. 252-429.00A.

Monti, James H., Jr., to International Telephone and Telegraph Corporation. Keyboard switch assembly. 4,315,114, Cl. 200-5.00A.

Montross, Jeffrey A.: *See*—
Leeds, Richard L.; Montross, Jeffrey A.; and Barbini, Richard J., 4,314,451, Cl. 62-68.000.

Moodie, Donald E., to Polaroid Corporation. Multipurpose film handling cassette having preliminary assembly condition. 4,314,744, Cl. 352-130.000.

Moon, Derryl E. Chiropractic table. 4,314,552, Cl. 128-70.000.

Moore, Robert A., to Westinghouse Electric Corp. Multiple co-surface acoustic wave filters. 4,315,228, Cl. 333-193.000.

Moore, William T.: *See*—
Stillwell, Peter F. T. C.; Moore, William T.; and Demaine, David G. A., 4,315,284, Cl. 358-209.000.

Moos, Kurt, to Gema AG. Method for spraying powdered to granular bulk material. 4,314,669, Cl. 239-1.000.

Moretto, Hans-Heinrich: *See*—
Steinberger, Helmut; Schonfelder, Manfred; Moretto, Hans-Heinrich; and Wegner, Christian, 4,315,091, Cl. 528-28.000.

Morgan, John H.; and Sutton, Larry W., to GTE Automatic Electric Laboratories, Inc. Apparatus protecting a lens from airborne particulates. 4,315,133, Cl. 219-121.0FS.

Mori, Fumio; Omura, Yoshiaki; Fujita, Yoshiji; Nishida, Takashi; Hosogai, Takeo; Wada, Fumio; Aihara, Sukeji; Tamai, Yoshin; and Itoi, Kazuo, to Kuraray Co., Ltd. Racemic modification consisting of specific isomers of α-cyano-3-phenoxybenzyl cis- or trans-2,2-dimethyl-3-(2,2,2-trichloroethyl)cyclopropanecarboxylate, production thereof and pesticidal compositions containing the same. 4,315,029, Cl. 424-304.000.

Mori, Kazumasa; Asahi, Taro; Banzai, Keiichiro; Iwaki, Katsutaro; Muto, Katsuya; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, to Nippondenso Co., Ltd. Generation control apparatus for vehicle generators. 4,315,205, Cl. 322-99.000.

Mori, Kenji: *See*—
Tsuji, Yoshiomi; Matsuda, Akio; Ikeda, Tamaki; and Mori, Kenji, 4,314,774, Cl. 405-115.000.

Morino, Toshiharu: *See*—
Takeuchi, Yuzu; Takada, Shigetaka; and Morino, Toshiharu, 4,314,535, Cl. 123-439.000.

Morise, Hiroshi: *See*—
Uemura, Yahiro; Arimura, Hirofumi; Morise, Hiroshi; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,314,935, Cl. 260-112.00R.

Moriya, Michio: *See*—
Kishi, Tuneo; Sasaki, Koji; and Moriya, Michio, 4,315,119, Cl. 200-145.000.

Morris, Robert I.; Metzger, Allan L.; and Weiss, Arnold S., to Rheumatology Diagnostics Laboratory. Method for diagnosing rheumatological diseases. 4,314,987, Cl. 424-1.000.

Morse, Herbert E.: *See*—
Calbert, Raymond E.; and Morse, Herbert E., 4,314,628, Cl. 193-2.00R.

Mortonson, Robert W.: *See*—
Sievers, Kirk A.; and Mortonson, Robert W., 4,315,204, Cl. 322-28.000.

Mosher, Richard K., to Controlonics Corporation. Radar signal detector. 4,315,261, Cl. 343-18.00E.

Mostek Corporation: *See*—
Hoffman, Gordon B.; and Callahan, Michael J., Jr., 4,315,108, Cl. 179-84.0VF.

Motoren- und Turbinen-Union Munchen GmbH: *See*—
Weiler, Wolfgang, 4,314,791, Cl. 415-115.000.

Motorola, Inc.: *See*—
Sievers, Kirk A.; and Mortonson, Robert W., 4,315,204, Cl. 322-28.000.

Motosugi, Katsuhiko; Takahashi, Hiroshi; Toyoda, Shuhei; Konomi, Toshiaki; and Matsui, Hideaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Intake system of a multi-cylinder internal combustion engine. 4,314,529, Cl. 123-52.0MB.

Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Belokoskov, Valentin I.; and Plotnikov, Vladimir P. Method for preparing titanium tanning agent. 4,314,975, Cl. 423-81.000.

Motzfeldt, Ketil. Method for carbothermic production of aluminum. 4,314,846, Cl. 75-10.00R.

Mulach, Arthur: *See*—
Calfo, Raymond M.; Alkire, Gerald R.; Dailey, George F.; and Mulach, Arthur, 4,315,173, Cl. 310-53.000.

Mulkins, George F.; Dombrowski, Jerome P.; and Isliker, Gaston R., to Bendix Corporation, The. Igniter plug. 4,315,298, Cl. 361-253.000.

Muller, Gottfried; and Hipp, Paul, to Schako-Metallwarenfabrik Ferdinand Schad GmbH. Solar collector for a window frame. 4,314,544, Cl. 126-417.000.

Muller, Walter; Gauer, Richard; Walkenhorst, Wilfried; and Wild, Gerhard, to Hoechst Aktiengesellschaft. Apparatus for a treatment of flowing media which causes heat exchange and mixing. 4,314,606, Cl. 165-163.000.

Multi-Elmac Company: *See*—
Apple, William C.; and Jacob, Keith D., 4,315,249, Cl. 340-825.520.

Multi-Flex Corporation: *See*—
Bjurman, James M., 4,314,717, Cl. 285-5.000.

Murakami, Shinichi; Nishihara, Hisakatsu; Yoshimitsu, Arata; and Noji, Sueyoshi, to Kubota Ltd. Manufacturing method of elbows made of cast stainless steel. 4,314,861, Cl. 148-12.00E.

Murphy, William W., to Torrington Company, The. Oscillating bearing. 4,314,732, Cl. 308-2.00R.

Muto, Katsuya: *See*—
Mori, Kazumasa; Asahi, Taro; Banzai, Keiichiro; Iwaki, Katsutaro; Muto, Katsuya; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,315,205, Cl. 322-99.000.

Naarmann, Herbert; Wulff, Guenter; and Akelah, Ahmed, to BASF Aktiengesellschaft. Polymers containing aromatic aldehyde groups. 4,315,089, Cl. 526-89.000.

Nagasawa, Kazutoshi: *See*—
Yamamoto, Kazuhiko; Matsushita, Yoshiaki; Kanamori, Masaru; Nagasawa, Kazutoshi; Yoshihiro, Naotsugu; and Kishino, Seigo, 4,314,595, Cl. 148-1.500.

Nakahara, Tsuneo; Yoshida, Kenichi; Tsuno, Koichi; and Isshiki, Isao, to Sumitomo Electric Industries, Ltd. Optical information reading device. 4,315,245, Cl. 340-146.3AG.

Nakaido, Shigehiro: *See*—
Ikeda, Hironosuke; Narukawa, Satoshi; and Nakaido, Shigehiro, 4,315,061, Cl. 429-161.000.

Nakajima, Yasuo; and Yoneda, Kenji, to Nissan Motor Co., Ltd. Feedback control system for internal combustion engine. 4,314,534, Cl. 123-438.000.

Nakako, Yukio; Ohzawa, Toshio; Yokota, Shizuo; and Tamura, Masaaki, to Kobe Steel, Ltd. Process for reforming coal. 4,314,898, Cl. 208-8.0LE.

Nakamura, Hiroshi: *See*—
Yamamoto, Kaneo; Nakamura, Hiroshi; and Konno, Toshio, 4,315,273, Cl. 357-27.000.

Nakamura, Masatoshi: *See*—
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Nakane, Ryohei; Isomura, Shohei; and Shimizu, Masami, to Rikagaku Kenkyusho; and Doryokuro Kakunenryo Kaihatsu Jigyodan. Multistage hydrogen water isotopic exchange column. 4,314,972, Cl. 422-191.000.

Nakano, Hiroshige: *See*—
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Nam Kwong Electric Co. Ltd.: *See*—
Chow, Shing C., 4,315,187, Cl. 313-217.000.

Narens, Robert L.; and Billeck, Frank D. Message control unit. 4,314,418, Cl. 40-358.000.

Narita, Hiroshi: *See*—
Ibamoto, Masahiko; Narita, Hiroshi; Oouchi, Noboru; and Okamatsu, Shigetoshi, 4,315,203, Cl. 318-807.000.

Narukawa, Satoshi: *See*—
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Naruse, Tunehide: *See*—
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National Can Corporation: *See*—
Basa, Kenneth B.; and Agusto, Robert G., 4,315,035, Cl. 426-250.000.
Levinson, Arthur A.; and Basa, Kenneth B., 4,315,034, Cl. 426-104.000.

National Research Development Corporation: *See*—
Smith, Kenneth C. A., 4,315,152, Cl. 250-396.0ML.

Navone, Mauro: *See*—
Beghelli, Benito; De Angelis, Vincenzo; and Navone, Mauro, 4,315,048, Cl. 428-78.000.

NCR Corporation: *See*—
Armstrong, Rolfe D.; and Walsh, Dennis A., 4,315,313, Cl. 364-200.000.
Schmidt, Carson T., 4,315,312, Cl. 364-200.000.

Neidell, Norman S. Navigational systems using phase encoded angular coordinates. 4,315,263, Cl. 343-112.00C.

Nelson, James R.: *See*—
McMullen, Charles H.; Nelson, James R.; Ream, Bernard C.; and Sims, Joseph A., Jr., 4,314,945, Cl. 260-340.200.

Nelson, Lyle A.: *See*—
Barnett, Burton; Kinsler, Martin R.; and Nelson, Lyle A., 4,314,682, Cl. 244-158.00R.

Neri, Amleto; and Sanchioni, Sergio, to Ftalital Prodotti Chimici Speciali S.p.A. Process for the continuous separation of maleic anhydride from process gases. 4,314,946, Cl. 260-346.760.

Netstal-Maschinen AG: *See*—
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Nichols, Margaret W., to Smarzak, Richard; and Wisner, Winifred, a part interest. Animal dryer. 4,314,410, Cl. 34-202.000.

Niggemann, Johann: *See*—
Boden, Heinrich; Rentz, Bernhard; Niggemann, Johann; and Just, Gerhard, 4,314,963, Cl. 264-328.600.

Nightingale, Charles: *See*—
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Nippon Electric Company, Ltd.: *See*—
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Tokunaga, Michio; Okada, Ryoichi; Mizutani, Hideo; Hasegawa, Koichi; and Osaki, Takaaki, 4,315,206, Cl. 323-265.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
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Nippon Kogaku K.K.: *See*—
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Nippondenso Co., Ltd.: *See*—
Mori, Kazumasa; Asahi, Taro; Banzai, Keiichiro; Iwaki, Katsutaro; Muto, Katsuya; Mase, Akira; Nimura, Takayasu; Itoh, Katsumi; and Akita, Yoshio, 4,315,205, Cl. 322-99.000.

Nishida, Takashi: *See*—
Mori, Fumio; Omura, Yoshiaki; Fujita, Yoshiji; Nishida, Takashi; Hosogai, Takeo; Wada, Fumio; Aihara, Sukeji; Tamai, Yoshin; and Itoi, Kazuo, 4,315,029, Cl. 424-304.000.

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Nishikawa, Seiichi; and Honda, Makoto, to Dai Nippon Insatsu Kabushiki Kaisha. Magnetic recording structure. 4,315,145, Cl. 235-493.000.

Nishimiya, Torazo; Okumura, Masamitsu; and Numakura, Seisaku, to Hitachi, Ltd. Proportional type electromagnetic valve. 4,314,585, Cl. 137-625.340.

Nissan Motor Co., Ltd.: *See*—
Asano, Masaharu; Tamura, Hideyuki; and Furuhashi, Shoji, 4,314,537, Cl. 123-440.000.
Ikeura, Kenji, 4,314,540, Cl. 123-571.000.
Kamoshita, Akio; Matsumoto, Akihiko; and Kurihara, Takashi, 4,314,710, Cl. 280-96.000.
Kanamaru, Koichi; and Takeuchi, Misao, 4,315,116, Cl. 200-61.090.
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Nakajima, Yasuo; and Yoneda, Kenji, 4,314,534, Cl. 123-438.000.
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Nisshin Steel Company, Ltd.: *See*—
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Niwa, Yukichi; Owada, Mitsutoshi; Asano, Noriyuki; Ogawa, Masahiko; and Tamura, Shuichi, to Canon Kabushiki Kaisha. Optical sensor device with reduction of ambient light effects. 4,315,159, Cl. 250-578.000.

Noguchi, Kunio, to Nippon Electric Company, Ltd. Magnetic tape transport system. 4,315,287, Cl. 360-95.000.

Noji, Sueyoshi: *See*—
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Nomoto, Sumio: *See*—
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Nordenskjold, Kjell, to Alfa-Laval AB. Milk receptacle with discharge valve. 4,314,526, Cl. 119-14.550.

Norfield Corporation: *See*—
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Norman, John H.; and Williamson, David G., to General Atomic Company. Catalytic decomposition of $H_2SO_4$. 4,314,982, Cl. 423-539.000.

Normier, Gerard: *See*—
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Norris, Robert D.: *See*—
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Nortronics Company, Inc.: *See*—
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Winkler, Thomas J., 4,315,293, Cl. 360-130.200.

Nova Biomedical Corporation: *See*—
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Novak, Josef: *See*—
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Novophalt SA: *See*—
Biegenzein, Gunter, 4,314,921, Cl. 260-28.5AS.

Nowack, Gerhard P.; and Johnson, Marvin M., to Phillips Petroleum Company. Catalytic hydrodesulfurization of an organic sulfur compound contained in gasoline. 4,314,901, Cl. 208-216.00R.

Noyori, Ryoji; Suzuki, Masaaki; and Kurozumi, Seizi, to Teitin Limited. Process for preparation of adjacently disubstituted ketones. 4,315,032, Cl. 424-317.000.

Nozawa, Koji, to Nissan Motor Co., Ltd. Synchronizer ring for transmission synchromesh device. 4,314,627, Cl. 192-53.00F.

NTN Toyo Bearing Company, Limited: *See*—
Deguchi, Osamu, 4,314,524, Cl. 118-54.000.

Nuffer, Daniel E.: *See*—
Beck, Boyd R.; Stewart, Lamar H.; Tapp, Steven; Anderson, Don L., Jr.; and Nuffer, Daniel E., 4,314,890, Cl. 203-1.000.

Numakura, Seisaku: *See*—
Nishimiya, Torazo; Okumura, Masamitsu; and Numakura, Seisaku, 4,314,585, Cl. 137-625.340.

Numata, Tatsuo; and Ishida, Kohji, to Pioneer Electronic Corporation. Switching circuit. 4,315,221, Cl. 330-51.000.

Nunlist, Erwin J.; Coleman, Howard G.; and Harrison, Edward S., to Sybron Corporation. Separable blade agitator assembly and disassembly method. 4,314,396, Cl. 29-156.80R.

N.V. Bekaert S.A.: *See*—
Moens, Joris, 4,314,853, Cl. 106-99.000.

N.V. Optische Industrie "De Oude Delft": *See*—
McStravick, Terence C.; and Sipkes, Peter, 4,315,185, Cl. 313-102.000.

Odle, Robert R.: *See*—
Stewart, Maxson L.; Odle, Robert R.; and Brunson, William W., 4,314,976, Cl. 423-139.000.

Oelert, Gerhard: *See*—
Jansen, Harald; Oelert, Gerhard; and Kohnke, Hans-Jurgen, 4,314,668, Cl. 237-2.00B.

Oepen, Heinz: *See*—
Feller, Otto; Kuhl, Manfred; and Oepen, Heinz, 4,314,492, Cl. 82-18.000.

Oeser, Heinz-Guenter: *See*—
Koenig, Karl-Heinz; Feuerherd, Karl-Heinz; and Oeser, Heinz-Guenter, 4,314,948, Cl. 260-453.00P.

Ogawa, Masahiko: *See*—
Niwa, Yukichi; Owada, Mitsutoshi; Asano, Noriyuki; Ogawa, Masahiko; and Tamura, Shuichi, 4,315,159, Cl. 250-578.000.

Ogino, Yasuo: *See*—
Suzuki, Akiyoshi; Hiraga, Ryozo; Kano, Ichiro; Yoshinari, Hideki; Totsuka, Masao; Kato, Yuzo; and Ogino, Yasuo, 4,315,201, Cl. 318-640.000.

ogly Dunyamaliev, Akhmed D.: *See*—
ogly Shakhtakhtinsky, Togrul N.; ogly Rzaev, Zakir M.; kyzy Mamedova, Svetlana G.; ogly Dunyamaliev, Akhmed D.; ogly Salakhov, Mustafa S.; and ogly Guseinov, Mustafa M., 4,314,851, Cl. 106-16.000.

ogly Guseinov, Mustafa M.: *See*—
ogly Shakhtakhtinsky, Togrul N.; ogly Rzaev, Zakir M.; kyzy Mamedova, Svetlana G.; ogly Dunyamaliev, Akhmed D.; ogly Salakhov, Mustafa S.; and ogly Guseinov, Mustafa M., 4,314,851, Cl. 106-16.000.

ogly Rzaev, Zakir M.: *See*—
ogly Shakhtakhtinsky, Togrul N.; ogly Rzaev, Zakir M.; kyzy Mamedova, Svetlana G.; ogly Dunyamaliev, Akhmed D.; ogly Salakhov, Mustafa S.; and ogly Guseinov, Mustafa M., 4,314,851, Cl. 106-16.000.

ogly Salakhov, Mustafa S.: *See*—
ogly Shakhtakhtinsky, Togrul N.; ogly Rzaev, Zakir M.; kyzy Mamedova, Svetlana G.; ogly Dunyamaliev, Akhmed D.; ogly Salakhov, Mustafa S.; and ogly Guseinov, Mustafa M., 4,314,851, Cl. 106-16.000.

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Oguro, Takeshi: *See*—
Tominaga, Tamotsu; Mihara, Teruyoshi; Oguro, Takeshi; and Takeuchi, Masami, 4,315,236, Cl. 338-4.000.

Ohhinata, Ichiro, to Hitachi, Ltd. Semiconductor switch. 4,315,168, Cl. 307-252.00G.

Ohki, Tsuguaki: *See*—
Sudo, Masatoshi; Higashi, Masanori; Ohki, Tsuguaki; and Kanbe, Shoji, 4,314,862, Cl. 148-12.00F.

Ohta, Hiroshi: *See*—
Horigome, Eiji; Azegami, Hitoshi; and Ohta, Hiroshi, 4,315,057, Cl. 428-694.000.

Ohzawa, Toshio: *See*—
Nakako, Yukio; Ohzawa, Toshio; Yokota, Shizuo; and Tamura, Masaaki, 4,314,898, Cl. 208-8.0LE.

Okabe, Tohru; Mizutani, Shigeaki; and Hayashi, Saburo, to Seitetsu Kagaku Co., Ltd. Tanning method. 4,314,803, Cl. 8-94.260.

Okada, Isao: *See*—
Kitagawa, Sadao; Okada, Isao; and Saito, Teruo, 4,315,088, Cl. 526-125.000.

Okada, Ryoichi: *See*—
Tokunaga, Michio; Okada, Ryoichi; Mizutani, Hideo; Hasegawa, Koichi; and Osaki, Takaaki, 4,315,206, Cl. 323-265.000.

Okamatsu, Shigetoshi: *See*—
Ibamoto, Masahiko; Narita, Hiroshi; Oouchi, Noboru; and Okamatsu, Shigetoshi, 4,315,203, Cl. 318-807.000.

Oki Electric Industry Co., Ltd.: *See*—
Tokunaga, Michio; Okada, Ryoichi; Mizutani, Hideo; Hasegawa, Koichi; and Osaki, Takaaki, 4,315,206, Cl. 323-265.000.

Oku, Yukio: *See*—
Hirakawa, Tadeshi; Kusubayashi, Tochiaki; and Oku, Yukio, 4,314,868, Cl. 156-207.000.

Okumura, Masamitsu: *See*—
Nishimiya, Torazo; Okumura, Masamitsu; and Numakura, Seisaku, 4,314,585, Cl. 137-625.340.

Oldham, Keith: *See*—
Jones, Derrick F.; and Oldham, Keith, 4,315,009, Cl. 424-248.400.

Oliff, James R., to Mead Corporation, The. Stacking device for tiers of articles. 4,314,633, Cl. 206-148.000.

Olsen, Donald. Musical instruments facilitating teaching, composing and improvisation. 4,314,499, Cl. 84-485.00R.

Omark Industries, Inc.: *See*—
Wilkinson, Harold C.; D'Attoma, Angelo M.; and Walker, Stephen W., 4,315,129, Cl. 219-99.000.

Omura, Yoshiaki: *See*—
Mori, Fumio; Omura, Yoshiaki; Fujita, Yoshiji; Nishida, Takashi; Hosogai, Takeo; Wada, Fumio; Aihara, Sukeji; Tamai, Yoshin; and Itoi, Kazuo, 4,315,029, Cl. 424-304.000.

Onishi, Haruo: *See*—
Mochida, Ei; Suzuki, Yasuo; Onishi, Haruo; and Kosuzume, Hiroshi, 4,315,003, Cl. 424-226.000.

Onishi, Hiroshi: *See*—
Yamashita, Sadahiko; Onishi, Hiroshi; Saito, Mitsuo; and Sagawa, Morikazu, 4,315,333, Cl. 455-189.000.

Onishi, Masayuki; and Miwa, Yoshiyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Electric rice cooker. 4,315,139, Cl. 219-441.000.

Onodera, Yutaka; and Yamashita, Tsutomu, to Tokoku University, The President of. Plural frequency type superconducting quantum interference fluxmeter. 4,315,215, Cl. 324-248.000.

Onoue, Keiji; Katoh, Takashi; Yoshida, Yoshiaki; and Seiki, Kazuo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Dust removing mechanism in open-end spinning frame. 4,314,440, Cl. 57-301.000.

Oouchi, Noboru: *See*—
Ibamoto, Masahiko; Narita, Hiroshi; Oouchi, Noboru; and Okamatsu, Shigetoshi, 4,315,203, Cl. 318-807.000.

Orban, John M., to Vivitar Corporation. Tactile indication and control system. 4,314,750, Cl. 354-198.000.

Orchard, Richard D.; Barbee, Kurt L.; Whiting, Bradford S.; Heussy, William C., deceased; and by Pavenstedt, Loyal L., executrix, to United States of America, Agriculture. Pesticide spray monitoring system for spray vehicles. 4,315,317, Cl. 364-510.000.

Oritake, Yoshie: *See*—
Harada, Tsuyoshi; and Oritake, Yoshie, 4,315,276, Cl. 358-8.000.

Osaki, Mikio; Kamada, Hiroshi; Kakimoto, Kohichi; and Tabuchi, Toshiaki, to Sharp Kabushiki Kaisha. Microimage registration system for loading and/or updating microfiches in microfilm cassette library. 4,315,322, Cl. 364-900.000.

Osaki, Takaaki: *See*—
Tokunaga, Michio; Okada, Ryoichi; Mizutani, Hideo; Hasegawa, Koichi; and Osaki, Takaaki, 4,315,206, Cl. 323-265.000.

Oschatz, Christian, to Sandoz Ltd. Fixation of reactive dyes on cellulosic fibers. 4,314,819, Cl. 8-630.000.

Osipow, Lloyd I.: *See*—
Spitzer, J. George; Marra, Dorothea C.; Osipow, Lloyd I.; and Claffey, Kevin, 4,314,573, Cl. 132-7.000.

Ottaviano, Gary W., to Ranpak Corp. Method of making cushioning dunnage. 4,314,865, Cl. 156-145.000.

Ouchi, Yoshiichi, to Kabushiki Kaisha Kubota Seisakusho. Swinging type rotors of centrifugal machines. 4,314,663, Cl. 233-26.000.

Ouellette, Maurice J.: *See*—
Robinson, Paul B.; Ouellette, Maurice J.; and Schmidt, Larry A., 4,315,251, Cl. 340-310.00A.

Outlaw, Benjamin T.: *See*—
Redmore, Derek; and Outlaw, Benjamin T., 4,315,087, Cl. 525-421.000.

Outokumpo Oy: *See*—
Uusitalo, Leo; and Tuominen, Pertti, 4,314,786, Cl. 414-57.000.

Owada, Mitsutoshi: *See*—
Niwa, Yukichi; Owada, Mitsutoshi; Asano, Noriyuki; Ogawa, Masahiko; and Tamura, Shuichi, 4,315,159, Cl. 250-578.000.

Owen, Edward E.; and Loveless, James F. Pole trailer. 4,314,712, Cl. 280-404.000.

Owens-Illinois, Inc.: *See*—
Amberg, Stephen W.; and Amberg, Ralph G., 4,314,799, Cl. 425-296.000.

Ozaki, Junichi: *See*—
Goto, Yasumasa; and Ozaki, Junichi, 4,315,189, Cl. 313-405.000.

Ozaki, Sadao: *See*—
Takahashi, Noboru; Ozaki, Sadao; Isono, Hiromasa; Nishihara, Toshikazu; Ikushima, Takeshi; and Naruse, Tunehide, 4,315,052, Cl. 428-328.000.

Ozari, Yehuda; and Barabas, Eugene S., to GAF Corporation. Core-shell composite polymers having high amounts of carboxylic acid units in the shell. 4,315,085, Cl. 525-301.000.

Ozawa Concrete Industry Co., Ltd.: *See*—
Ozawa, Seiichi, 4,314,957, Cl. 264-102.000.

Ozawa, Keiji: *See*—
Kinjo, Hisao; and Ozawa, Keiji, 4,315,283, Cl. 358-128.600.

Ozawa, Seiichi, to Ozawa Concrete Industry Co., Ltd. Method for manufacture of polymer-impregnated hollow concrete product. 4,314,957, Cl. 264-102.000.

Ozawa, Toshiaki: *See*—
Yamada, Yasuaki; Ozawa, Toshiaki; and Kondo, Hiroatsu, 4,315,200, Cl. 318-603.000.

Pack Image, Inc.: *See*—
Stone, Orison W., 4,314,634, Cl. 206-167.000.

Package Machinery Company: *See*—
LaFleur, Paul J., Jr.; and Crescenzo, Francis C., 4,314,785, Cl. 414-46.000.

Pagnotta, Gasper: *See*—
Hamilton, William C.; Moffatt, William G.; and Pagnotta, Gasper, 4,315,175, Cl. 310-71.000.

Pai, Panemangalore S.: *See*—
Petersen, Harro; Pai, Panemangalore S.; and Reichert, Manfred, 4,314,806, Cl. 8-187.000.

Pako Corporation: *See*—
Anderson, Richard D.; Fauchier, Jess F., II; and Laciak, Francis M., 4,314,757, Cl. 355-29.000.
Kaufmann, Kenneth M., 4,314,753, Cl. 354-321.000.

Pallos, Ferenc M.: *See*—
Chin, Hsiao-Ling M.; and Pallos, Ferenc M., 4,315,030, Cl. 424-304.000.

Palmer, Harry E.; Stenning, David G. C.; and Crockett, Ray K., to Dome Petroleum Limited. Offshore drilling and production structure. 4,314,776, Cl. 405-205.000.

Palmer, Oliver E.: *See*—
Sodder, George, Jr.; and Palmer, Oliver E., 4,314,615, Cl. 175-94.000.

Palmer, William B.; and Giebler, Martin M., to TRW Inc. Rigid collapsible dish structure. 4,315,265, Cl. 343-840.000.

Papanu, Victor D.: *See*—
Crutchfield, Marvin M.; Papanu, Victor D.; and Warren, Craig B., 4,315,092, Cl. 528-230.000.

Paquette, Gerald J. Process of preparing combustible solid fuel. 4,314,825, Cl. 44-10.00A.

Park, Du P. Hair cutting device. 4,314,405, Cl. 30-133.000.

Parkerson, Charles R.: *See*—
Wieder, Herman H.; and Parkerson, Charles R., 4,314,873, Cl. 156-610.000.

Parks, William L., III; and Harwood, Clifford, to Kardios Systems Corporation, The. Method and apparatus for enhancing the capabilities of a computing system. 4,315,321, Cl. 364-900.000.

Parmerlee, James K.; and Tague, B. Dale, to United States of America, Navy. Cooling arrangement for plug-in module assembly. 4,315,300, Cl. 361-382.000.

Parnell, Lyle J.; and Fabio, James L., to MacLean-Fogg Company. Quick release load securement device. 4,314,783, Cl. 410-34.000.

Partyka, Richard A.; and Hudyma, Thomas W., to Westwood Pharmaceuticals, Inc. 1-Phenethylimidazole derivatives. 4,315,023, Cl. 424-273.00R.

Pasdera, Leonard A., to Ampex Corporation. Apparatus for providing error compensation in a digital video recording and reproducing system. 4,315,278, Cl. 358-16.000.

Pasdera, Leonard A.: *See*—
Lemoine, Maurice G.; and Pasdera, Leonard A., 4,315,331, Cl. 371-31.000.

Patel, Natu R.: *See*—
Hoffmann, Otto L.; and Patel, Natu R., 4,314,843, Cl. 71-92.000.

Patterson, Richard A.: *See*—
Seabold, Thomas W.; Patterson, Richard A.; and de Neui, Richard P., 4,315,047, Cl. 428-64.000.

Paul, Dennis J.; and Speedy, Lloyd J. Roll holder and dispenser. 4,314,679, Cl. 242-55.300.

Pavenstedt, Loyal L., executrix: *See*—
Orchard, Richard D.; Barbee, Kurt L.; Whiting, Bradford S.; Heussy, William C., deceased; and Pavenstedt, Loyal L., executrix, 4,315,317, Cl. 364-510.000.

Payne, Frank, to Robertshaw Controls Company. Method and apparatus for translating frequency of mechanical movement into a pneumatic signal. 4,314,532, Cl. 123-198.00A.

PCUK Produits Chimiques Ugine Kuhlmann: *See*—
Deabriges, Jean, 4,314,979, Cl. 423-329.000.
Defretin, Francis; Eudeline, Jean-Paul; Schoch, Elisabeth; and Voisin, Alain, 4,314,907, Cl. 252-22.000.

Peabody Coal Company, Inc.: *See*—
Haley, Jack R.; Smith, Jimmy B.; and Mansfield, Vaughn, 4,314,887, Cl. 202-91.000.

Pearl, Antony S., deceased: *See*—
Liddell, Peter R.; Pearl, Antony S., deceased; and Calvert, Edmund, administrator, 4,314,764, Cl. 356-315.000.

Peelen, Jan G. J.: *See*—
Feenstra, Johannes; Klop, Marius A. F.; Meerman, Wilhelmus C. P. M.; Peelen, Jan G. J.; and Tuin, Hermanus N., 4,314,834, Cl. 65-11.100.

Pelc, Rafael, to International Business Machines Corporation. Self-switching bidirectional digital line driver. 4,315,167, Cl. 307-241.000.

Pelloux-Gervais, Pierre, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Cryogenic storage devices. 4,314,450, Cl. 62-45.000.

Pelton, Robert S. Method of producing foamed construction materials. 4,314,835, Cl. 65-22.000.

Penn, Silas. Reversible electric motor. 4,315,170, Cl. 310-39.000.

Perakis, Mike; and DeBenedictis, Henry J., to Perakis, Mike. Measuring dispenser. 4,314,657, Cl. 222-162.000.

Perez-Albuerne, Evelio A.: *See*—
Tyan, Yuan-Sheng; and Perez-Albuerne, Evelio A., 4,315,096, Cl. 136-244.000.

Perie, Chantal: *See*—
Pigeon, Marcel; Szretter, Marta; and Perie, Chantal, 4,315,065, Cl. 430-175.000.

Peritz, Lyonnel: *See*—
Grollier, Jean-Francois; Monnais, Christian; and Peritz, Lyonnel, 4,314,807, Cl. 8-406.000.

Perkins, Joseph R., III; and Woodland, Sylvester L., to Sortex North America, Inc. Mechanical rejection system for automatic sorting machines. 4,314,645, Cl. 209-638.000.

Permacel: *See*—
Korpman, Ralf, 4,314,558, Cl. 128-283.000.

Perra, Andrew G., Jr.; and Sparhawk, George H., Jr., to Markem Corporation. Stencil printing. 4,314,503, Cl. 101-41.000.

Peters, Hans-Werner: *See—*
Block, Dieter; Gesell, Reinhard; and Peters, Hans-Werner, 4,315,136, Cl. 219-216.000.
Peters, Thomas E.; and McColl, James R., to GTE Laboratories Incorporated. Zinc silicate phosphor with extended florescence decay and cathode ray tube containing the same. 4,315,190, Cl. 313-467.000.
Petersen, Gene R.: *See—*
United States of America, National Aeronautics and Space Administration; Lawson, Daniel D.; and Petersen, Gene R., 4,314,984, Cl. 423-579.000.
Petersen, Harro; Pai, Panemangalore S.; and Reichert, Manfred, to BASF Aktiengesellschaft. Textile finish and processes for its preparation and use. 4,314,806, Cl. 8-187.000.
Peterson, Harold A. Backwater valve. 4,314,583, Cl. 137-533.110.
Petralia, Salvatore C., to Keene Corporation. Quartz light fixture. 4,315,302, Cl. 362-226.000.
Petrolite Corporation: *See—*
Redmore, Derek; and Outlaw, Benjamin T., 4,315,087, Cl. 525-421.000.
Pettersson, John P. Apparatus for arrangement of combined stationary and slip form casting of concrete. 4,314,798, Cl. 425-63.000.
Pettersson, Torsten L. E., to Een-Holmgren Ortopediska AB. Method of making a lower leg prostheses. 4,314,398, Cl. 29-407.000.
Pfeifer, Friedrich; and Behnke, Wernfried, to Vacuumschmelze GmbH. Reducing magnetic hysteresis losses in cores of thin tapes of soft magnetic amorphous metal alloys. 4,314,594, Cl. 148-108.000.
Pfister, Theodor; Schenk, Wolfgang; and Blank, Heinz U., to Bayer Aktiengesellschaft. Process for the preparation of sulphonic acid chlorides. 4,314,950, Cl. 260-543.00R.
Pfleiderer, Ernst: *See—*
Monsheimer, Rolf; Pfleiderer, Ernst; Siol, Werner; Boessler, Hanns; and Trabitzsch, Hans, 4,314,800, Cl. 8-94.10R.
Monsheimer, Rolf; and Pfleiderer, Ernst, 4,314,801, Cl. 8-94.140.
PFZ Enterprises Inc.: *See—*
Zuuring, Peter F., 4,314,708, Cl. 280-11.180.
Phillips Petroleum Company: *See—*
Allison, George M., III, 4,314,926, Cl. 260-33.6AQ.
Macleod, Kenneth S.; and Fink, Gary, 4,314,958, Cl. 264-167.000.
Nowack, Gerhard P.; and Johnson, Marvin M., 4,314,901, Cl. 208-216.00R.
Picard, Richard H.: *See—*
Ezekiel, Shaoul; Leiby, Clare C.; Picard, Richard H.; Willis, Charles R.; and Hackel, Richard P., 4,315,224, Cl. 331-3.000.
Piccirilli, Robert: *See—*
Chang, Wen-Hsuan; Piccirilli, Robert; and Diehl, David A., 4,314,923, Cl. 260-29.40R.
Picker Corporation: *See—*
Furbee, Avery D., 4,315,182, Cl. 313-59.000.
Sell, Leslie J., 4,315,156, Cl. 250-445.00T.
Piduch, Hans-Gunter: *See—*
Kwasnik, Hans-Jurgen; and Piduch, Hans-Gunter, 4,314,787, Cl. 414-163.000.
Kwasnik, Hans-Jurgen; and Piduch, Hans-Gunter, 4,314,889, Cl. 202-241.000.
Pierce Chemical Company: *See—*
Royer, Garfield P., 4,315,074, Cl. 435-70.000.
Pierrat, Michel A. Log splitter with improved clamp. 4,314,591, Cl. 144-193.00A.
Pierre Fabre S.A.: *See—*
Dussourd d'Hinterland, Lucien; and Normier, Gerard, 4,314,994, Cl. 424-95.000.
Pierson, Marvin B.; and Dunbar, Frank C., to Armco Inc. Low tin terne coated steel article. 4,315,056, Cl. 428-645.000.
Pigeon, Marcel; Szretter, Marta; and Perie, Chantal, to Rhone-Poulenc Systemes. Oleophilic, film-forming photopolymerizable diazo and epoxy resin compositions and lithographic plates prepared therefrom. 4,315,065, Cl. 430-175.000.
Pioneer Electronic Corporation: *See—*
Numata, Tatsuo; and Ishida, Kohji, 4,315,221, Cl. 330-51.000.
Ploog, Uwe: *See—*
Heine, Christian; Ploog, Uwe; and Wust, Reinhold, 4,315,040, Cl. 426-609.000.
Plotnikov, Vladimir P.: *See—*
Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Belokoskov, Valentin I.; and Plotnikov, Vladimir P., 4,314,975, Cl. 423-81.000.
Plumpton, Norman A.; and Tomlin, Malcolm G., to Coal Industry (Patents) Limited. Mineral mining machine with high pressure fluid nozzle and intensifier. 4,314,730, Cl. 299-75.000.
Polaroid Corporation: *See—*
Fitzgerald, Maurice J., 4,315,071, Cl. 430-627.000.
Moodie, Donald E., 4,314,744, Cl. 352-130.000.
Polymicro: *See—*
Fox, Sidney W.; and Holden, Arthur I., 4,315,072, Cl. 430-628.000.
Polytechna, podnik zahranicniho obchodu pro zprostredkovani technicke spoluprace: *See—*
Dolejsi, Ivan; and Spur, Miloslav, 4,314,822, Cl. 23-230.00B.
Popov, Vladimir V.: *See—*
Karpov, Evgeny F.; Birenberg, Isaak E.; Basovsky, Boris I.; and Popov, Vladimir V., 4,314,475, Cl. 73-27.00R.
Poris, Jaime: *See—*
Raistrick, Ian D.; Poris, Jaime; and Huggins, Robert A., 4,315,059, Cl. 429-112.000.
Posso, Patrick. Case for packing a tape cassette or the like. 4,314,637, Cl. 206-387.000.
Post Office, The: *See—*
Greaves, Alan J.; Greenaway, Philip E.; and Nightingale, Charles, 4,315,229, Cl. 333-216.000.
Poth, Ulrich; Moller, Dieter; and Dobbelstein, Arnold, to BASF Farben & Fasern AG. Base coats covered by a clear lacquer coating and process for coating. 4,315,053, Cl. 428-423.700.
Potts, James H. All-purpose weather guard. 4,314,727, Cl. 297-184.000.
PPG Industries, Inc.: *See—*
Birkmeyer, William J.; Lewarchik, Ronald J.; Klanica, Joseph A.; and Anderson, Carl C., 4,314,918, Cl. 260-20.000.
Breininger, J. Shannon; and Greenberg, Charles B., 4,315,055, Cl. 428-434.000.
Chang, Wen-Hsuan; Piccirilli, Robert; and Diehl, David A., 4,314,923, Cl. 260-29.40R.
Lavanish, Jerome M., 4,314,842, Cl. 71-90.000.
Seymour, Samuel L., 4,314,836, Cl. 65-114.000.
Praet, Larry Raymond: *See—*
Clark, John D., 4,314,721, Cl. 292-262.000.
Praturi, Ananda: *See—*
Hsu, George C.; Levin, Harry; Hogle, Richard A.; Praturi, Ananda; and Lutwack, Ralph, 4,314,525, Cl. 118-716.000.
Prewo, Karl M.: *See—*
Brennan, John J.; and Prewo, Karl M., 4,314,852, Cl. 501-88.000.
Pricca, Angelo: *See—*
Giannini, Umberto; Longi, Paolo; Deluca, Domenico; and Pricca, Angelo, 4,314,911, Cl. 252-429.00A.
Procter & Gamble Company, The: *See—*
Bettle, Griscom, III; Mills, Howard; and Richter, Edward B., 4,314,949, Cl. 260-502.00R.
Denny, William D., Jr.; and Wetzel, Thomas A., 4,314,990, Cl. 424-52.000.
Proter S.p.A.: *See—*
De Barbieri, Augusto, 4,314,999, Cl. 424-177.000.
Pruden, Samuel H., to Cushman Industries, Incorporated. Chucks of constant jaw force. 4,314,706, Cl. 279-1.00C.
Purdue Research Foundation: *See—*
Etzel, James E.; and Wachinski, Anthony M., 4,314,905, Cl. 210-670.000.
PureCycle Corporation: *See—*
Blades, Frederick K., 4,315,325, Cl. 367-98.000.
Purnell, Robert C. Devices for supporting hanging plants. 4,314,646, Cl. 211-113.000.
Putnam, Abbott A.; and Locklin, David W., to Battelle Memorial Institute. Heating apparatus. 4,314,444, Cl. 60-39.770.
Quarz-Zeit AG: *See—*
Schwab, Jean-Francois, 4,315,328, Cl. 368-66.000.
Queiser, Horst; Meichsner, Othmar; and Erbse, Dietmark, to Kraftwerk Union Aktiengesellschaft. Method and apparatus for drying radioactive waste water concentrates from evaporators. 4,314,877, Cl. 159-47.0WL.
Quinn, Donald R.: *See—*
Santilli, Vincent J.; and Quinn, Donald R., 4,315,184, Cl. 313-94.000.
Qume Corporation: *See—*
Lin, Frank W.; and Sze, Mei S., 4,315,198, Cl. 318-594.000.
R. Levati S.p.A.: *See—*
Levati, Renzo, 4,315,039, Cl. 426-482.000.
Rabassa, Ernest A., to S & M Block System of U.S. Corporation. Mortar-less interlocking building block system. 4,314,431, Cl. 52-259.000.
Rabinowitz, Mario: *See—*
Dougherty, John J.; Rabinowitz, Mario; and Bahder, George, 4,315,098, Cl. 174-15.00S.
Racor Industries, Inc.: *See—*
Wilson, Michael E., 4,314,689, Cl. 251-351.000.
Radiochemical Centre Limited, The: *See—*
Ruddock, Clinton F., 4,314,986, Cl. 424-1.000.
Raduechel, Bernd: *See—*
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Mannesmann, Gerda; Losert, Wolfgang; and Casals, Jorge, 4,315,013, Cl. 424-263.000.
Raistrick, Ian D.; Poris, Jaime; and Huggins, Robert A., to United States of America, Energy. Molten salt lithium cells. 4,315,059, Cl. 429-112.000.
Rancurel, Alain: *See—*
Cerf, Olivier; Grenier, Georges; Hermier, Jean; and Rancurel, Alain, 4,314,965, Cl. 422-28.000.
Randall, Russel R., to Dresser Industries, Inc. Method and apparatus for measuring neutron characteristics of material surrounding a borehole. 4,315,148, Cl. 250-262.000.
Rank Organisation Limited, The: *See—*
Stillwell, Peter F. T. C.; Moore, William T.; and Demaine, David G. A., 4,315,284, Cl. 358-209.000.
Rankin, John C. Gaseous tube control circuit. 4,315,218, Cl. 328-8.000.
Ranpak Corp.: *See—*
Ottaviano, Gary W., 4,314,865, Cl. 156-145.000.
Ranz, Erwin; Lohmann, Joachim W.; and Schutz, Heinz-Dieter, to Agfa-Gevaert Aktiengesellschaft. Color-photographic recording material containing a highly reactive dir-coupler. 4,315,070, Cl. 430-505.000.
Rasmussen, Poul R.: *See—*
von Daehne, Welf; and Rasmussen, Poul R., 4,315,004, Cl. 424-238.000.

Rast, Howard E., to United States of America, Navy. Optical gain control device. 4,314,743, Cl. 350-354.000.

Rauckhorst, James E.; and Skingle, Thomas J., to Acme-Cleveland Corporation. Die-cast masonry drill with leading hard insert. 4,314,616, Cl. 175-394.000.

Ravaglia, Andrea: *See*—
Daniele, Vincenzo; Corda, Giuseppe; Ravaglia, Andrea; and Ferla, Giuseppe, 4,315,239, Cl. 338-308.000.

Raychem Corporation: *See*—
Broyles, Harry C.; and Szalvay, Laszlo, 4,314,718, Cl. 285-114.000.
Middleman, Lee M.; and Gotcher, Alan J., 4,315,237, Cl. 338-22.00R.

Raytheon Company: *See*—
Schmoock, James C., 4,315,209, Cl. 323-313.000.
Vorhaus, James L., 4,315,272, Cl. 357-22.000.

RCA Corporation: *See*—
Bloom, Allen; Seffren, Sidney S.; Bell, Alan E.; and Bartolini, Robert A., 4,315,269, Cl. 346-135.100.
Gibson, Walter G.; and Wagner, Theodor M., 4,315,277, Cl. 358-8.000.
Miller, Arthur, 4,314,546, Cl. 126-425.000.
Russo, Paul M., 4,315,314, Cl. 364-200.000.
Steigmeier, Edgar F.; and Knop, Karl, 4,314,763, Cl. 356-237.000.

Real Gas & Electric Company, Inc.: *See*—
Snyder, Donald W., 4,315,303, Cl. 363-21.000.

Ream, Bernard C.: *See*—
McMullen, Charles H.; Nelson, James R.; Ream, Bernard C.; and Sims, Joseph A., Jr., 4,314,945, Cl. 260-340.200.

Reddy, Junuthula N., to Bendix Corporation, The. Electronic fuel control system including electronic means for providing a continuous variable correction factor. 4,314,538, Cl. 123-485.000.

Redel, Karl-Georg; and Deppisch, Gerd, to Leybold Heraeus GmbH. High-voltage supply for power electron-beam guns. 4,315,195, Cl. 315-107.000.

Redic, Robert C.: *See*—
Fraser, Robert; Rouse, John; Redic, Robert C.; and Frock, Suzanne, 4,314,635, Cl. 206-232.000.

Redifon Simulation Ltd.: *See*—
Spooner, Archer M., 4,315,240, Cl. 340-27.00R.
Spooner, Archer M., 4,315,241, Cl. 340-27.00R.

Redmore, Derek; and Outlaw, Benjamin T., to Petrolite Corporation. Quaternary polyaminoamides. 4,315,087, Cl. 525-421.000.

Rees, Werner, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Printing machine doctor blade adjustment apparatus. 4,314,506, Cl. 101-365.000.

Reichert, Manfred: *See*—
Petersen, Harro; Pai, Panemangalore S.; and Reichert, Manfred, 4,314,806, Cl. 8-187.000.

Reid, Melville R. Pelt fat removal apparatus. 4,314,465, Cl. 69-40.000.

Reimann, Horst: *See*—
Theysohn, Rainer; and Reimann, Horst, 4,314,927, Cl. 260-37.00N.

Reinhardt, Friedrich: *See*—
Feess, Erich; and Reinhardt, Friedrich, 4,314,811, Cl. 8-457.000.

Reisman, Elias; Goodsell, David S.; and Masino, Fred S., to Ford Aerospace & Communications Corp. Non-contacting thermal energy transfer assembly. 4,314,449, Cl. 62-3.000.

Reitz, Otfried: *See*—
Artweger, Wolfgang; and Reitz, Otfried, 4,314,726, Cl. 296-164.000.

Reliable Security Systems, Inc.: *See*—
Logan, Emanuel L., Jr., 4,314,722, Cl. 292-263.000.

Remond, Georges: *See*—
Vincent, Michel; Remond, Georges; and Bure, Jacques, 4,315,031, Cl. 424-309.000.

Rentz, Bernhard: *See*—
Boden, Heinrich; Rentz, Bernhard; Niggemann, Johann; and Just, Gerhard, 4,314,963, Cl. 264-328.600.

Research Foundation of State University of New York, The: *See*—
Rudin, Stephen, 4,315,146, Cl. 250-515.000.

Reudink, Douglas O.: *See*—
Acampora, Anthony; and Reudink, Douglas O., 4,315,262, Cl. 343-100.0ST.

Rexroad, James O., to Westinghouse Electric Corp. Drawout circuit interrupter. 4,315,115, Cl. 200-50.0AA.

Reymond, Jean C.; Hidalgo, Jean L.; and Skenderoff, Claude, to Thomson-CSF. Arrangement for locating radiating sources. 4,314,761, Cl. 356-141.000.

Reymont, Bertrand, to Alfred Wertli Inc. Apparatus for guiding and supporting a continuously cast slab. 4,314,600, Cl. 164-448.000.

Reynolds, John M.; Gibson, Colin E.; Seamans, John S.; and van der Steen, Anton R. F., to Land and Marine Engineering Limited. Trench digging apparatus and bearing therefor. 4,314,414, Cl. 37-54.000.

Reynolds Metals Company: *See*—
Goolsby, Patrick F.; and Swenck, George F., 4,314,397, Cl. 29-157.30R.

Rheumatology Diagnostics Laboratory: *See*—
Morris, Robert I.; Metzger, Allan L.; and Weiss, Arnold S., 4,314,987, Cl. 424-1.000.

Rhone-Poulenc Industries: *See*—
Derrien, Jean-Yves; and Seigneurin, Laurent, 4,314,913, Cl. 252-464.000.

Rhone-Poulenc Systemes: *See*—
Pigeon, Marcel; Szretter, Marta; and Perie, Chantal, 4,315,065, Cl. 430-175.000.

Rice, Ivan G. Steam-cooled blading with steam thermal barrier for reheat gas turbine combined with steam turbine. 4,314,442, Cl. 60-39.050.

Rice, Thomas K., to Minnesota Mining and Manufacturing Company. Sandwich immunoassay using piezoelectric oscillator. 4,314,821, Cl. 23-230.00B.

Rich, William E., Jr.; Smith, Frank C.; and McNeill, Janet L., to Dionex Corporation. Combination apparatus and method for chromatographic separation and quantitative analysis of multiple ionic species. 4,314,823, Cl. 23-230.00R.

Richardson, Charles N., to Tri-State Oil Tool Industries, Inc. Method and apparatus for well treating. 4,314,608, Cl. 166-250.000.

Richter, Edward B.: *See*—
Bettle, Griscom, III; Mills, Howard; and Richter, Edward B., 4,314,949, Cl. 260-502.00R.

Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; and Drexler, Ferenc, 4,314,939, Cl. 260-239.30P.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyoorgy; Dancsi, Lajos; Keve, Tibor; Karpati, Egon; and Szporny, Laszlo, 4,315,011, Cl. 424-262.000.

Ricoh Co., Ltd.: *See*—
Kunikane, Makoto; Umehara, Masaakira; Uji-Ie, Koji; and Taniguchi, Kiyoshi, 4,315,068, Cl. 430-341.000.

Riewerts, Paul R.; and Wolak, David J., to Deere & Company. Foldable implement and pivotal brace therefor. 4,314,610, Cl. 172-776.000.

Rikagaku Kenkyusho: *See*—
Nakane, Ryohei; Isomura, Shohei; and Shimizu, Masami, 4,314,972, Cl. 422-191.000.

Riken Vitamine Oil Co., Ltd.: *See*—
Fukuda, Tetsuro; Matsuura, Hideo; Koizumi, Yoshihito; and Yamaguchi, Takeshi, 4,315,041, Cl. 426-653.000.

Ringdal, Lars, to Bakelittfabrikken A/S. Method of producing molded bodies of expanded plastic. 4,314,954, Cl. 264-45.500.

Ritter, Gerhard: *See*—
Schmidt, Gerhard; Ritter, Klaus; and Ritter, Gerhard, 4,315,125, Cl. 219-56.000.

Ritter, Klaus: *See*—
Schmidt, Gerhard; Ritter, Klaus; and Ritter, Gerhard, 4,315,125, Cl. 219-56.000.

Rittler, Hermann L.: *See*—
Beall, George H.; and Rittler, Hermann L., 4,314,909, Cl. 252-629.000.

Rivoire, Jacques. Stable and precise cryogenic device. 4,314,459, Cl. 62-514.00R.

Ro, David H.; Klar, Erhard; and Whitman, C. I., to SCM Corporation. Maximizing the corrosion resistance of tin containing stainless steel powder compacts. 4,314,849, Cl. 75-228.000.

Robert Bosch GmbH: *See*—
Holzbaur, Siegfried; and Eckert, Konrad, 4,314,951, Cl. 261-44.00D.
Kramer, Manfred; Schmid, Werner; and Cramer, Hans-Dieter, 4,315,118, Cl. 200-80.00R.
Wolff, Manfred, 4,315,213, Cl. 324-162.000.

Robert, Christian: *See*—
Duguet, Pierre; and Robert, Christian, 4,314,715, Cl. 280-801.000.

Robertshaw Controls Company: *See*—
Beaman, Norman V., 4,314,478, Cl. 73-304.00C.
Payne, Frank, 4,314,532, Cl. 123-198.00A.

Robinson, Dale D.: *See*—
Hade, Conrad; and Robinson, Dale D., 4,314,458, Cl. 62-256.000.

Robinson, Paul B.; Ouellette, Maurice J.; and Schmidt, Larry A., to General Electric Company. Automatic meter reading and control system. 4,315,251, Cl. 340-310.00A.

Rocheleau, David; and Ayukawa, Karl, to Canadian Patents & Development Limited. Amplitude controlled digital oscillator. 4,315,219, Cl. 328-14.000.

Rockwell International Corporation: *See*—
Barnett, Burton; Kinsler, Martin R.; and Nelson, Lyle A., 4,314,682, Cl. 244-158.00R.
Tomasetta, Louis R.; and Law, H. David, 4,314,858, Cl. 148-1.500.
White, Stanley A., 4,315,319, Cl. 364-571.000.

Rockwell-Rimoldi, S.p.A.: *See*—
Touret, Jean P., 4,314,516, Cl. 112-152.000.

Rodgers, Robert E.: *See*—
Bayer, Raymond M.; and Rodgers, Robert E., 4,314,699, Cl. 273-73.00D.

Roesch, Edgar B., to Roesch Trust, The. Integral window units. 4,314,598, Cl. 160-90.000.

Roesch Trust, The: *See*—
Roesch, Edgar B., 4,314,598, Cl. 160-90.000.

Roger, Bernard, to U.S. Philips Corporation. Power transistor and method of manufacturing same. 4,315,271, Cl. 357-20.000.

Roger, Pierre: *See*—
Malen, Charles; Roger, Pierre; and Laubie, Michel, 4,315,019, Cl. 424-272.000.
Malen, Charles E.; Roger, Pierre; and Laubie, Michel, 4,315,020, Cl. 424-272.000.

Rohde, Vernon C.: *See*—
Boeckel, John W.; Rohde, Vernon C.; and Wells, John R., 4,314,523, Cl. 118-50.000.

Rohm GmbH: *See*—
Monsheimer, Rolf; Pfleiderer, Ernst; Siol, Werner; Boessler, Hanns; and Trabitzsch, Hans, 4,314,800, Cl. 8-94.10R.
Monsheimer, Rolf; and Pfleiderer, Ernst, 4,314,801, Cl. 8-94.140.

Rohm and Haas Company: *See*—
Beier, William C.; and Hodder, James J., 4,314,802, Cl. 8-94.260.
Swithenbank, Colin; and Fujimoto, Ted T., 4,314,844, Cl. 71-92.000.
Rohner, Joachim; and Zumfeld, Heinz, to W. Schlafhorst & Co. Splicing device. 4,314,437, Cl. 57-22.000.
Romero, Georges: *See*—
Gerardot, Claude; and Romero, Georges, 4,315,099, Cl. 174-47.000.
Roper Corporation: *See*—
Rosenbaum, Per, 4,314,432, Cl. 52-484.000.
Rose, David; Busch, Peter; Lieske, Edgar; and Konrad, Gunther, to Henkel Kommanditgesellschaft auf Aktien. Novel coupler components for oxidation hair dyes, the manufacture thereof, and hair colorants. 4,314,809, Cl. 8-406.000.
Rosen, Gerald M. Methionine sulfoxide amflioration of acetaminophen toxicity. 4,314,989, Cl. 424-10.000.
Rosenbaum, Per, to Roper Corporation. Splice for beam in suspended ceiling system. 4,314,432, Cl. 52-484.000.
Rossignol, Jean F. Specific parasiticidal use of 2-benzamido-5-nitrothiazole derivatives. 4,315,018, Cl. 424-270.000.
Rourke, Rosemary, to Norfield Corporation. Laminates structure of an expanded core panel and a flat sheet of material which does not easily bond and a process for making the same. 4,315,050, Cl. 428-116.000.
Rourke, Rosemary. Process for expanding thermoformable materials having clear surfaces and the resultant products. 4,315,051, Cl. 428-119.000.
Rouse, John: *See*—
Fraser, Robert; Rouse, John; Redic, Robert C.; and Frock, Suzanne, 4,314,635, Cl. 206-232.000.
Roussel Uclaf: *See*—
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,315,012, Cl. 424-263.000.
Roy, Joseph N. A.: *See*—
Couture, Joseph E. G.; and Roy, Joseph N. A., 4,315,043, Cl. 427-212.000.
Royer, Garfield P., to Pierce Chemical Company. Molecular transformation procedure. 4,315,074, Cl. 435-70.000.
Royet, Paul F. Wheel-mounted luggage. 4,314,624, Cl. 190-18.00A.
Ruddock, Clinton F., to Radiochemical Centre Limited, The. Method and container for reducing pertechnetate. 4,314,986, Cl. 424-1.000.
Rudelick, John, to Universal-Rundle Corporation. Mixing faucet valve with diverter and stop check system. 4,314,673, Cl. 239-443.000.
Rudin, Stephen, to Research Foundation of State University of New York, The. Process and apparatus for scatter reduction in radiography. 4,315,146, Cl. 250-515.000.
Ruiz, Rene A.; and Spector, George. Razor with pre-wetting or capillarizer system. 4,314,404, Cl. 30-41.000.
Rusch, Reinhart: *See*—
Kruger, Hans-Rudolf; Arndt, Friedrich; Baumert, Dietrich; and Rusch, Reinhart, 4,314,839, Cl. 71-73.000.
Russo, Paul M., to RCA Corporation. Priority vectored interrupt having means to supply branch address directly. 4,315,314, Cl. 364-200.000.
Ruzicka, Jaromir: *See*—
Hansen, Elo H.; and Ruzicka, Jaromir, 4,314,824, Cl. 23-230.00R.
Ryan, Douglas G., to Exxon Research & Engineering Co. Mechanically agitated liquid-vapor contacting apparatus. 4,314,886, Cl. 196-14.500.
S.A.M. Silvatrim: *See*—
Bronne, Henri, 4,314,641, Cl. 206-443.000.
S & M Block System of U.S. Corporation: *See*—
Rabassa, Ernest A., 4,314,431, Cl. 52-259.000.
S.R.M. Hydromekanik Aktiebolag: *See*—
Ahlen, Karl G., 4,314,487, Cl. 74-865.000.
Sack, Werner; and Lindig, Otto, to Jenaer Glaswerk Schott & Gen. Crack-resistant, heat-absorbing fusion glasses enabling low processing temperatures for the hermetic encapsulation of electronic components. 4,315,054, Cl. 428-433.000.
Saegusa, Nobuaki; Sakaki, Masakatsu; and Yanai, Genzo, to Sankyo Electric Company Limited; and Yanai Seiko Company Limited. Method for producing a magnetic rotatable member for an electromagnetic clutch. 4,314,472, Cl. 72-341.000.
Sagae, Kyuta, to Terumo Corporation. Intravascular catheter assembly. 4,314,555, Cl. 128-214.400.
Sagawa, Morikazu: *See*—
Yamashita, Sadahiko; Onishi, Hiroshi; Saito, Mitsuo; and Sagawa, Morikazu, 4,315,333, Cl. 455-189.000.
Sahr, Eugene V.: *See*—
Bronisz, Larry F.; and Sahr, Eugene V., 4,315,323, Cl. 364-900.000.
Saint Marcoux, Roland; and Fink, Leon, to L.C.C.-C.I.C.E. Compagnie Europeenne de Composants Electroniques; and Thomson-CSF. Power capacitor with high heat dissipation. 4,315,299, Cl. 361-274.000.
Saito, Kazutoshi: *See*—
Chinone, Naoki; Saito, Kazutoshi; Shige, Noriyuki; and Ito, Ryoichi, 4,315,226, Cl. 372-45.000.
Saito, Mitsuo: *See*—
Yamashita, Sadahiko; Onishi, Hiroshi; Saito, Mitsuo; and Sagawa, Morikazu, 4,315,333, Cl. 455-189.000.
Saito, Teruo: *See*—
Kitagawa, Sadao; Okada, Isao; and Saito, Teruo, 4,315,088, Cl. 526-125.000.
Saito, Toru; and Takeshima, Masaki, to Hitachi, Ltd. Method and system for regenerating dehumidifier for use in charcoal adsorber. 4,314,828, Cl. 55-26.000.
Sakai, Shinji: *See*—
Kawabata, Takashi; Hosoe, Kazuyas; Shinoda, Nobuhiko; Sakai, Shinji; and Kinoshita, Takao, 4,314,748, Cl. 354-25.000.
Sakaki, Masakatsu: *See*—
Saegusa, Nobuaki; Sakaki, Masakatsu; and Yanai, Genzo, 4,314,472, Cl. 72-341.000.
Sakamaki, Hisashi: *See*—
Shimizu, Katsuichi; Sawamura, Osamu; Masuda, Shunichi; Tomosada, Masahiro; and Sakamaki, Hisashi, 4,314,754, Cl. 355-14.00C.
Sakami, Ryoichiro; and Hirayama, Yoshihiko, to Kabushiki Kaisha Daini Seikosha. Electronic timepiece radio. 4,315,332, Cl. 455-181.000.
Sakamoto, Masaaki, to Kabushiki Kaisha Komatsu Seisakusho. Steering apparatus for a hydraulically driven vehicle. 4,314,617, Cl. 180-6.480.
Saku, Isamu. Sheathed heating element and sealing of sheathed electric heating element. 4,314,401, Cl. 29-611.000.
Saleh, Adel A. M., to Bell Telephone Laboratories, Incorporated. Power combiner arrangement for microwave amplifiers. 4,315,222, Cl. 330-124.00D.
Salzer, Erwin. Composite fusible element and electric fuse comprising the element. 4,315,234, Cl. 337-159.000.
Sanchioni, Sergio: *See*—
Neri, Amleto; and Sanchioni, Sergio, 4,314,946, Cl. 260-346.760.
Sandoz Ltd.: *See*—
Courtin, Alfred, 4,314,818, Cl. 8-549.000.
Gertisser, Berthold, 4,314,817, Cl. 8-539.000.
Oschatz, Christian, 4,314,819, Cl. 8-630.000.
Sanekata, Nobuo, to Yuasa Battery Company Limited. Machine for automatically stacking plate groups for storage batteries. 4,314,403, Cl. 29-730.000.
Sankyo Electric Company Limited: *See*—
Saegusa, Nobuaki; Sakaki, Masakatsu; and Yanai, Genzo, 4,314,472, Cl. 72-341.000.
Terauchi, Kiyoshi, 4,314,796, Cl. 417-294.000.
Santek, Inc.: *See*—
Michel, Thomas J.; and Clarke, Robert, 4,315,210, Cl. 324-57.00R.
Santilli, Vincent J.; and Quinn, Donald R., to Westinghouse Electric Corp. Image tube. 4,315,184, Cl. 313-94.000.
Santoni, Cesar, to Greif Bros. Corporation. Split ring locking assembly. 4,314,720, Cl. 292-256.690.
Sanyo Electric Co., Ltd.: *See*—
Ikeda, Hironosuke; Narukawa, Satoshi; and Nakaido, Shigehiro, 4,315,061, Cl. 429-161.000.
Sareen, Bal K., to Fuller Company. Journal and end closure for tubular vessels. 4,314,677, Cl. 241-176.000.
Sarna, Abraham; and Sarna, David, to A. Sarna & Son Limited. Artist's portfolio. 4,314,625, Cl. 190-16.000.
Sarna, David: *See*—
Sarna, Abraham; and Sarna, David, 4,314,625, Cl. 190-16.000.
Sarre, Andre F. M.: *See*—
Causse, Jean-Marie; and Sarre, Andre F. M., 4,315,311, Cl. 364-200.000.
Sarstedt, Walter. Capillary receptacle. 4,314,570, Cl. 128-763.000.
Sasaki, Koji: *See*—
Kishi, Tuneo; Sasaki, Koji; and Moriya, Michio, 4,315,119, Cl. 200-145.000.
Sato, Shichiro. Jack. 4,314,691, Cl. 254-126.000.
Saucedo, Manuel M.: *See*—
Jimenez, Miguel A.; and Saucedo, Manuel M., 4,314,515, Cl. 111-77.000.
Sauer, Alfred E.; and Tassoni, Bruno, to B. A. Ballou & Co., Incorporated. Double fold over jewelry clasp. 4,314,389, Cl. 24-376.000.
Saurin, Emmanuel E. V. V.; and Gariglio, Ezio V. Process and apparatus for welding tubular bodies. 4,315,132, Cl. 219-121.0LD.
Sawada, Michiyuki: *See*—
Hirano, Tomiyoshi; Shinada, Hidehiro; and Sawada, Michiyuki, 4,315,186, Cl. 313-111.000.
Sawamura, Osamu: *See*—
Shimizu, Katsuichi; Sawamura, Osamu; Masuda, Shunichi; Tomosada, Masahiro; and Sakamaki, Hisashi, 4,314,754, Cl. 355-14.00C.
Schade, Maynard W. Fuel line pressure equalizer for internal combustion engine. 4,314,539, Cl. 123-514.000.
Schaefer, Eberhard: *See*—
Hohenschutz, Heinz; Gnad, Josef; Dinkhauser, Guenter; and Schaefer, Eberhard, 4,314,947, Cl. 260-410.000.
Schaefer, Peter R.; and Carkhuff, Donald W., to Union Carbide Corporation. Method of air cutting and gouging and a combined torch and nozzle assembly. 4,315,126, Cl. 219-70.000.
Schaeffer, Ernest. Step motors. 4,315,171, Cl. 310-49.00R.
Schako-Metallwarenfabrik Ferdinand Schad GmbH: *See*—
Muller, Gottfried; and Hipp, Paul, 4,314,544, Cl. 126-417.000.
Scharf, Wayne L.: *See*—
Darringer, Richard E.; Scharf, Wayne L.; and Haggerty, James S., 4,315,150, Cl. 250-338.000.
Scheinberg, Israel H. Method of treatment of rheumatoid arthritis. 4,315,028, Cl. 424-290.000.
Schenk, Wolfgang: *See*—
Pfister, Theodor; Schenk, Wolfgang; and Blank, Heinz U., 4,314,950, Cl. 260-543.00R.
Scher, Herbert B., to Stauffer Chemical Company. Benzyl thiocarbamate sulfoxides stabilized with calcium carbonate carrier. 4,314,841, Cl. 71-88.000.

Schering Aktiengesellschaft: *See*—
Kruger, Hans-Rudolf; Arndt, Friedrich; Baumert, Dietrich; and Rusch, Reinhart, 4,314,839, Cl. 71-73.000.
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Mannesmann, Gerda; Losert, Wolfgang; and Casals, Jorge, 4,315,013, Cl. 424-263.000.

Schering Corporation: *See*—
McCombie, Stuart W., 4,314,942, Cl. 260-245.20R.

Schiefer, Erwin: *See*—
Leibhard, Erich; Schiefer, Erwin; and Stirnweiss, Peter, 4,314,655, Cl. 222-146.0HE.

Schiesser AG: *See*—
Schiesser, Walter H., 4,314,872, Cl. 156-500.000.

Schiesser, Walter H., to Schiesser AG. Apparatus for equipping profiles formed of elastic masses with velour bands. 4,314,872, Cl. 156-500.000.

Schlessel, Joseph H.: *See*—
Fish, Aaron M.; Schlessel, Joseph H.; and Minski, Seymour B., 4,314,780, Cl. 409-81.000.

Schluderberg, Donald C.: *See*—
Edwards, Gerald T.; and Schluderberg, Donald C., 4,314,885, Cl. 376-327.000.

Schmalbein, Dieter: *See*—
Biehl, Reinhard; and Schmalbein, Dieter, 4,315,230, Cl. 333-227.000.

Schmelzer, Christoph; Spohr, Reimar; Krumme, Jens-Peter; Witter, Klaus; and Heitmann, Heinrich, to U.S. Philips Corporation. Method of making a magnetic memory layer. 4,314,894, Cl. 204-192.00M.

Schmid, Werner: *See*—
Kramer, Manfred; Schmid, Werner; and Cramer, Hans-Dieter, 4,315,118, Cl. 200-80.00R.

Schmidt, Alfred, to Alfred Schmidt GmbH. Foliage trimmer. 4,314,435, Cl. 56-13.300.

Schmidt, Carson T., to NCR Corporation. Cache memory having a variable data block size. 4,315,312, Cl. 364-200.000.

Schmidt, Gerhard; Ritter, Klaus; and Ritter, Gerhard, to EVG Entwicklungs- u. Verwertungs-Gesellschaft m.b.H. Lattice welding machine with disc electrode. 4,315,125, Cl. 219-56.000.

Schmidt, Larry A.: *See*—
Robinson, Paul B.; Ouellette, Maurice J.; and Schmidt, Larry A., 4,315,251, Cl. 340-310.00A.

Schmitt, Frederick L.: *See*—
Wiegers, Wilhelmus J.; Sprecker, Mark A.; Watkins, Hugh; Vock, Manfred H.; and Schmitt, Frederick L., 4,314,915, Cl. 252-522.00R.

Schmoock, James C., to Raytheon Company. Temperature compensated voltage reference circuit. 4,315,209, Cl. 323-313.000.

Schneider, Walter: *See*—
Boden, Heinrich; and Schneider, Walter, 4,314,955, Cl. 264-51.000.

Schnitger, Herbert: *See*—
Weigl, Walter; Bergman, Ulf; Baum, Lennart; and Schnitger, Herbert, 4,315,154, Cl. 250-402.000.

Schoch, Elisabeth: *See*—
Defretin, Francis; Eudeline, Jean-Paul; Schoch, Elisabeth; and Voisin, Alain, 4,314,907, Cl. 252-22.000.

Schoening, Josef: *See*—
Fritz, Rolf; Schoening, Josef; Elter, Claus; and Theymann, Walter, 4,314,883, Cl. 376-381.000.

Schonfelder, Manfred: *See*—
Steinberger, Helmut; Schonfelder, Manfred; Moretto, Hans-Heinrich; and Wegner, Christian, 4,315,091, Cl. 528-28.000.

Schotten, Henno, to Bosch-Siemens Hausgerate GmbH. Adjustable electronic temperature control, especially for refrigerators or the like. 4,314,666, Cl. 236-78.00R.

Schrock, Donald C., to Streamway Corporation. Rotary valve washerless cartridge. 4,314,581, Cl. 137-454.500.

Schulze, Heinz; Zimmerman, Robert L.; and Waddill, Harold G., to Texaco Development Corporation. Process of making an isocyanurate foam. 4,315,079, Cl. 521-115.000.

Schumacher, Peter M., to Electronic Devices Incorporated. Write and edit circuitry for electronic marking of displayed TV signal images. 4,315,282, Cl. 358-107.000.

Schutz, Heinz-Dieter: *See*—
Ranz, Erwin; Lohmann, Joachim W.; and Schutz, Heinz-Dieter, 4,315,070, Cl. 430-505.000.

Schwab, Jean-Francois, to Quarz-Zeit AG. Battery-driven clock with indicator of the end of life of the battery. 4,315,328, Cl. 368-66.000.

Schwan, Erich. Device for mounting a shelf on a column. 4,314,685, Cl. 248-242.000.

Schwartz, Boris. Hammer with selectively actuated auxiliary head. 4,314,593, Cl. 145-29.00R.

Schwendener, Derek K.; Ainsworth, Neil L.; and Foss, Richard J., to Chloride Group Limited. Vent plugs for electric storage batteries. 4,315,058, Cl. 429-84.000.

Science Union et Cie: *See*—
Malen, Charles; Roger, Pierre; and Laubie, Michel, 4,315,019, Cl. 424-272.000.
Malen, Charles E.; Roger, Pierre; and Laubie, Michel, 4,315,020, Cl. 424-272.000.
Vincent, Michel; Remond, Georges; and Bure, Jacques, 4,315,031, Cl. 424-309.000.

SCM Corporation: *See*—
Ro, David H.; Klar, Erhard; and Whitman, C. I., 4,314,849, Cl. 75-228.000.

Scott, John G. V.; and Harvey, Anthony K., to Ciba Geigy AG. Color coupler combination. 4,315,069, Cl. 430-365.000.

Seabold, Thomas W.; Patterson, Richard A.; and de Neui, Richard P., to Minnesota Mining and Manufacturing Company. Curled tape, roll, and container end. 4,315,047, Cl. 428-64.000.

Seamans, John S.: *See*—
Reynolds, John M.; Gibson, Colin E.; Seamans, John S.; and van der Steen, Anton R. F., 4,314,414, Cl. 37-54.000.

Seffren, Sidney S.: *See*—
Bloom, Allen; Seffren, Sidney S.; Bell, Alan E.; and Bartolini, Robert A., 4,315,269, Cl. 346-135.100.

Seigneurin, Laurent: *See*—
Derrien, Jean-Yves; and Seigneurin, Laurent, 4,314,913, Cl. 252-464.000.

Seikenkai: *See*—
Hata, Kosei; Hata, Tadayo; and Maruoka, Toshiyuki, 4,314,995, Cl. 424-93.000.

Seiki, Kazuo: *See*—
Onoue, Keiji; Katoh, Takashi; Yoshida, Yoshiaki; and Seiki, Kazuo, 4,314,440, Cl. 57-301.000.

Seitetsu Kagaku Co., Ltd.: *See*—
Okabe, Tohru; Mizutani, Shigeaki; and Hayashi, Saburo, 4,314,803, Cl. 8-94.260.

Seki, Shojiro: *See*—
Matsuzaki, Kiyoto; Seki, Shojiro; and Aya, Norimoto, 4,315,134, Cl. 219-203.000.

Sekido, Satoshi; and Ariga, Kozo, to Matsushita Electric Industrial Company, Limited. Oxygen sensor. 4,314,996, Cl. 422-98.000.

Sekine, Yoichi: *See*—
Sonoda, Nobuo; Shimotsuma, Wataru; Kishimoto, Yoshio; and Sekine, Yoichi, 4,315,267, Cl. 346-1.100.

Seligmann, Peter C., to AECI Limited. Sequential initiation of explosives. 4,314,507, Cl. 102-217.000.

Sell, Leslie J., to Picker Corporation. X-ray apparatus. 4,315,156, Cl. 250-445.00T.

Semco Instruments, Inc.: *See*—
Hancock, Geoffrey, 4,315,296, Cl. 361-103.000.

Sendo, Masaaki; and Suzuki, Kinzo, to Mitsubishi Denki Kabushiki Kaisha. Electric motor. 4,315,176, Cl. 310-83.000.

Senni, Paolo; and Toderi, Nando, to SNIA Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Method for the purification of raw caprolactam. 4,314,940, Cl. 260-239.30A.

Sentralinstitutt for industriell forskning: *See*—
Mehlum, Even; and Lovhaugen, Odd, 4,314,739, Cl. 350-3.660.

Seuffert, Werner: *See*—
Brauer, Gerhard; Adam, Peter; and Seuffert, Werner, 4,314,692, Cl. 254-362.000.

Severinsson, Lars M. Method of producing moulds. 4,314,399, Cl. 29-420.000.

Sexton, Peter: *See*—
DeCristofaro, Nicholas J.; and Sexton, Peter, 4,314,661, Cl. 228-263.00R.

Seymour, Samuel L., to PPG Industries, Inc. Glass sheet tempering apparatus with nozzle arrangement providing fluid escape paths and method of tempering glass sheets. 4,314,836, Cl. 65-114.000.

SGS Ates, Componenti Elettronici S.P.A.: *See*—
Daniele, Vincenzo; Corda, Giuseppe; Ravaglia, Andrea; and Ferla, Giuseppe, 4,315,239, Cl. 338-308.000.

Shanbrom, Edward. Purification of plasma protein products. 4,314,997, Cl. 424-101.000.

Shapland, Earl P., to Flo-Con Systems, Inc. Rotary valve. 4,314,659, Cl. 222-590.000.

Sharber, John M. Battery analyzer for electric golf carts. 4,315,217, Cl. 324-434.000.

Sharp Kabushiki Kaisha: *See*—
Kinashi, Hiroshi, 4,314,755, Cl. 355-14.00D.
Osaki, Mikio; Kamada, Hiroshi; Kakimoto, Kohichi; and Tabuchi, Toshiaki, 4,315,322, Cl. 364-900.000.

Shaw, John C. M., to Spotmanor Limited. Rearing unit. 4,314,527, Cl. 119-16.000.

Shearer, James W.: *See*—
Hartman, Charles W.; and Shearer, James W., 4,314,879, Cl. 376-128.000.

Shen, Ming-Shing; Chen, James M.; and Yang, Ralph T., to United States of America, Energy. Preparation of reactive beta-dicalcium silicate. 4,314,980, Cl. 423-331.000.

Shephard, Margaret C.: *See*—
Balassubramanyan, Sugavanam; and Shephard, Margaret C., 4,315,016, Cl. 424-269.000.

Shichi, Shigeharu: *See*—
Kasahara, Takahiko; Yamaguchi, Tukasa; Shichi, Shigeharu; Kato, Masayuki; and Suito, Senji, 4,314,517, Cl. 112-260.000.

Shida, Masaharu: *See*—
Torisawa, Akira; Ueda, Makoto; and Shida, Masaharu, 4,315,329, Cl. 368-76.000.

Shida, Tomohiko: *See*—
Inagaki, Masahisa; Jinbou, Ryutarou; Unino, Tomio; and Shida, Tomohiko, 4,315,130, Cl. 219-121.00L.

Shields, James J.: *See*—
Yannone, Robert A.; and Shields, James J., 4,314,441, Cl. 60-39.28R.

Shifrin, Isaak G.: *See*—
Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Belokoskov, Valentin I.; and Plotnikov, Vladimir P., 4,314,975, Cl. 423-81.000.

Shige, Noriyuki: *See*—
Chinone, Naoki; Saito, Kazutoshi; Shige, Noriyuki; and Ito, Ryoichi, 4,315,226, Cl. 372-45.000.
Shilander, Frank R.; and Kiss, Gyorgy, to La Salle Machine Tool, Inc. Power roller accumulating conveyor. 4,314,629, Cl. 198-500.000.
Shimizu, Katsuichi; Sawamura, Osamu; Masuda, Shunichi; Tomosada, Masahiro; and Sakamaki, Hisashi, to Canon Kabushiki Kaisha. Image forming apparatus. 4,314,754, Cl. 355-14.00C.
Shimizu, Masami, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Oil seal device. 4,314,705, Cl. 277-67.000.
Shimizu, Masami: *See*—
Nakane, Ryohei; Isomura, Shohei; and Shimizu, Masami, 4,314,972, Cl. 422-191.000.
Shimizu, Shyoichi; and Torii, Ken-Ichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Frequency divider. 4,315,165, Cl. 307-225.00R.
Shimotsuma, Wataru: *See*—
Sonoda, Nobuo; Shimotsuma, Wataru; Kishimoto, Yoshio; and Sekine, Yoichi, 4,315,267, Cl. 346-1.100.
Shinada, Hidehiro: *See*—
Hirano, Tomiyoshi; Shinada, Hidehiro; and Sawada, Michiyuki, 4,315,186, Cl. 313-111.000.
Shingu, Yuji: *See*—
Kondo, Kaneichi; and Shingu, Yuji, 4,315,180, Cl. 310-319.000.
Shinoda, Nobuhiko: *See*—
Kawabata, Takashi; Hosoe, Kazuyas; Shinoda, Nobuhiko; Sakai, Shinji; and Kinoshita, Takao, 4,314,748, Cl. 354-25.000.
Shionogi & Co., Ltd.: *See*—
Ito, Kanji; Ikawa, Kenji; Yukinaga, Hisajiro; and Sugita, Jitsuo, 4,314,845, Cl. 71-103.000.
Shiraki, Manabu: *See*—
Ban, Itsuki; Shiraki, Manabu; and Egami, Kazuhito, 4,315,177, Cl. 310-154.000.
Ban, Itsuki; Shiraki, Manabu; and Egami, Kazuhito, 4,315,178, Cl. 310-154.000.
Shiraki, Masao: *See*—
Miyamoto, Noriaki; Shiraki, Masao; and Mitsuya, Kinpei, 4,314,438, Cl. 57-58.890.
Shoemaker, Dwight E. Combination drafting instrument including rotatable scales, compass assembly and straight edge magnifier. 4,314,408, Cl. 33-494.000.
Shufelt, Rainey A.: *See*—
Cooper, Glenn D.; Lee, Gim F., Jr.; and Shufelt, Rainey A., 4,315,084, Cl. 525-69.000.
Sieglita, Manfred, to Gustav F. Gerdts KG. Angle valve. 4,314,584, Cl. 137-613.000.
Siemens Aktiengesellschaft: *See*—
Brauer, Gerhard; Adam, Peter; and Seuffert, Werner, 4,314,692, Cl. 254-362.000.
Franke, Kurt, 4,315,155, Cl. 250-409.000.
Walla, Klaus, 4,315,103, Cl. 179-1.0VC.
Warnest, Albert, 4,315,233, Cl. 337-66.000.
Siemens-Albis Aktiengesellschaft: *See*—
Kupfer, Hanspeter, 4,315,260, Cl. 343-7.500.
Siemens Corporation: *See*—
Kukreja, Jagmohan S., 4,315,290, Cl. 360-106.000.
Weigl, Walter; Bergman, Ulf; Baum, Lennart; and Schnitger, Herbert, 4,315,154, Cl. 250-402.000.
Siemon, Edward C., to Borg-Warner Corporation. Controlled D-C power supply. 4,315,305, Cl. 363-88.000.
Sievers, Kirk A.; and Mortonson, Robert W., to Motorola, Inc. Ripple detector for automotive alternator battery charging systems. 4,315,204, Cl. 322-28.000.
Sigworth, Harry W., Jr., to Chevron Research Company. Thermal expansion check valve. 4,314,667, Cl. 236-93.00R.
Silbernagel, Frederick J. Load transfer trailer for transit mixer. 4,314,709, Cl. 280-81.00A.
Silvey, Elmer R. Tree felling system with cam-operated hydraulic check valve. 4,314,592, Cl. 144-34.00A.
Sims, Joseph A., Jr.: *See*—
McMullen, Charles H.; Nelson, James R.; Ream, Bernard C.; and Sims, Joseph A., Jr., 4,314,945, Cl. 260-340.200.
Sindlinger, Ronald E.: *See*—
Armstrong, Donald E.; Sindlinger, Ronald E.; and Harvey, William J., 4,314,394, Cl. 29-25.160.
Sindoni, Giuseppe. Multiple automatic metering device. 4,314,653, Cl. 222-41.000.
Singer Company, The: *See*—
Wurst, John W.; and Beckerman, Howard L., 4,315,250, Cl. 340-286.00R.
Sinloihi Company Limited: *See*—
Wakimoto, Saburo; Miyahara, Sadayasu; and Iiyosu, Yoshihiko, 4,314,932, Cl. 260-42.530.
Siol, Werner: *See*—
Monsheimer, Rolf; Pfleiderer, Ernst; Siol, Werner; Boessler, Hanns; and Trabitzsch, Hans, 4,314,800, Cl. 8-94.10R.
Sipkes, Peter: *See*—
McStravick, Terence C.; and Sipkes, Peter, 4,315,185, Cl. 313-102.000.
Sipos, Tibor, to Johnson & Johnson Products Inc. Sulfonated polyamino acids as dental plaque barriers. 4,314,991, Cl. 424-56.000.
Skenderoff, Claude: *See*—
Reymond, Jean C.; Hidalgo, Jean L.; and Skenderoff, Claude, 4,314,761, Cl. 356-141.000.
Skingle, Thomas J.: *See*—
Rauckhorst, James E.; and Skingle, Thomas J., 4,314,616, Cl. 175-394.000.
Skiven, David A.; Sortor, Charles J.; and Tessier, Raymond J., to General Motors Corporation. Side stream separator for boiler particulate emission control. 4,314,830, Cl. 55-217.000.
Skoda, oborovny podnik, Plzen: *See*—
Mlynarik, Jan; Novak, Josef; and Gregor, Jiri, 4,314,690, Cl. 254-29.00A.
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Mannesmann, Gerda; Losert, Wolfgang; and Casals, Jorge, to Schering, Aktiengesellschaft. Certain pyrrole analogs of prostacyclin derivatives. 4,315,013, Cl. 424-263.000.
Skwirut, Henry; and Young, Robert G., to Westinghouse Electric Corp. Fluorescent lamp using high performance phosphor blend which is protected from color shifts by a very thin overcoat of stable phosphor of similar chromaticity. 4,315,192, Cl. 313-487.000.
Slyman Manufacturing Corporation: *See*—
Bratko, Rudolph S., 4,314,542, Cl. 126-110.00R.
Slysh, Paul, to General Dynamics Corporation. Device and method for assembling large space structures. 4,314,636, Cl. 206-321.000.
Smarzak, Richard: *See*—
Nichols, Margaret W., 4,314,410, Cl. 34-202.000.
Smith, Clark K. Specialized filing cabinet. 4,314,733, Cl. 312-183.000.
Smith, Frank C.: *See*—
Rich, William E., Jr.; Smith, Frank C.; and McNeill, Janet L., 4,314,823, Cl. 23-230.00R.
Smith, Harry A.: *See*—
Berazosky, Sandra; and Smith, Harry A., 4,314,925, Cl. 260-33.20R.
Smith, Jimmy B.: *See*—
Haley, Jack R.; Smith, Jimmy B.; and Mansfield, Vaughn, 4,314,887, Cl. 202-91.000.
Smith, Kenneth C. A., to National Research Development Corporation. Electron beam apparatus. 4,315,152, Cl. 250-396.0ML.
Smith, Kenneth V.; and Taylor, Jack D., to Carstab Corporation. Organohalide polymers stabilized with an organotin compound and an ortho mercapto phenol compound. 4,314,934, Cl. 260-45.75S.
Smith, Robert K., to Gould Inc. Saturable magnetic steel encased coil for arc spinner interrupter. 4,315,121, Cl. 200-147.00R.
Smith, Stephen A.: *See*—
Wootton, Gordon; and Smith, Stephen A., 4,315,022, Cl. 424-273.00R.
SmithKline Corporation: *See*—
Huffman, William F.; and Wilson, James W., 4,314,944, Cl. 260-326.150.
Smithkline-RIT: *See*—
Wijnendaele, Frans V., 4,314,993, Cl. 424-92.000.
SNIA Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A.: *See*—
Leoni, Roberto; Baldini, Alberto; Calloni, Angelo; and Angelini, Gianfranco, 4,314,959, Cl. 264-187.000.
Senni, Paolo; and Toderi, Nando, 4,314,940, Cl. 260-239.30A.
Snyder, Donald W., to Real Gas & Electric Company, Inc. DC Converter. 4,315,303, Cl. 363-21.000.
Snyder, Ronald R.: *See*—
Kirkpatrick, Robert G.; and Snyder, Ronald R., 4,314,501, Cl. 89-12.000.
Societe Anonyme Automobiles Citroen: *See*—
Duguet, Pierre; and Robert, Christian, 4,314,715, Cl. 280-801.000.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Husaini, Saeed A.; and Liu, Richard T., 4,315,036, Cl. 426-387.000.
Societe de Vente de l' Aluminium Pechiney: *See*—
Baril, Jacques; and Gaborieau, Jean-Yves, 4,314,468, Cl. 72-57.000.
Societe Nationale des Poudres et Explosifs: *See*—
Dalet, Francis A., 4,314,509, Cl. 102-288.000.
Sodder, George, Jr.; and Palmer, Oliver E., to Sodder, George, Jr. Self-propelled drilling head. 4,314,615, Cl. 175-94.000.
Solar Unlimited, Inc.: *See*—
Frederick, Larry D.; and Somers, Richard E., 4,314,602, Cl. 165-10.000.
Solomon, Allen L., to McDonnell Douglas Corporation. Back contacted MIS photovoltaic cell. 4,315,097, Cl. 136-255.000.
Somers, Richard E.: *See*—
Frederick, Larry D.; and Somers, Richard E., 4,314,602, Cl. 165-10.000.
Somerville Belkin Industries Limited: *See*—
Dagostine, Leslie J., 4,314,642, Cl. 206-621.000.
Sommer, Gordon M., to G. M. Sommer Company, Inc. Drive system. 4,314,626, Cl. 192-0.02R.
Sommer, Ruediger; and Wischer, Hermann, to Dr.-Ing. Rudolf Hell GmbH. Methods for converting a video signal into a black/white signal. 4,315,285, Cl. 358-280.000.
Sonderegger, Hans-Conrad: *See*—
Wolfer, Peter; Derrer, Hans-Rudolf; Vollenweider, Max; and Sonderegger, Hans-Conrad, 4,314,481, Cl. 73-774.000.
Sonoda, Nobuo; Shimotsuma, Wataru; Kishimoto, Yoshio; and Sekine, Yoichi, to Matsushita Electric Industrial Co., Ltd. Method of magnetofluidic recording. 4,315,267, Cl. 346-1.100.
Sortex North America, Inc.: *See*—
Perkins, Joseph R., III; and Woodland, Sylvester L., 4,314,645, Cl. 209-638.000.
Sortor, Charles J.: *See*—
Skiven, David A.; Sortor, Charles J.; and Tessier, Raymond J., 4,314,830, Cl. 55-217.000.
Southwest Oilfield Products, Inc.: *See*—
Leman, A. Louis, Jr., 4,314,688, Cl. 251-191.000.
Southwire Company: *See*—
Stewart, Maxson L.; Odle, Robert R.; and Brunson, William W., 4,314,976, Cl. 423-139.000.

Sowman, Harold G.: *See*—
Leitheiser, Melvin A.; and Sowman, Harold G., 4,314,827, Cl. 51-298.000.
Spamer, William S., to Mead Corporation, The. Gravity feed shelf. 4,314,648, Cl. 211-49.00D.
Sparhawk, George H., Jr.: *See*—
Perra, Andrew G., Jr.; and Sparhawk, George H., Jr., 4,314,503, Cl. 101-41.000.
Spaziani, Frederick F.; and Fowler, James E., to Nova Biomedical Corporation. Method of making liquid membrane electrode. 4,314,895, Cl. 204-195.00M.
Spector, George: *See*—
Casteel, Ernest; and Spector, George, 4,314,429, Cl. 52-127.000.
Ruiz, Rene A.; and Spector, George, 4,314,404, Cl. 30-41.000.
Speedy, Lloyd J.: *See*—
Paul, Dennis J.; and Speedy, Lloyd J., 4,314,679, Cl. 242-55.300.
Speich, Francisco, to Textilma AG. Loom. 4,314,588, Cl. 139-79.000.
Speno, Joanne E. Bra for athletic activities. 4,314,569, Cl. 128-425.000.
Sperry Corporation: *See*—
DeBusscher, Cyriel R. J.; and Strubbe, Gilbert J. I., 4,314,571, Cl. 130-27.200.
Spigarelli, Donald J., to Hybrid Technology Corporation. Solder removal technique. 4,315,042, Cl. 427-96.000.
Spijkerman, Johan, to Studsvik Energiteknik AB. Method and apparatus for transmitting and receiving electromagnetically generated and received ultrasonic pulses. 4,314,479, Cl. 73-643.000.
Spitzer, J. George; Marra, Dorothea C.; Osipow, Lloyd I.; and Claffey, Kevin. Process for conditioning hair. 4,314,573, Cl. 132-7.000.
Spohr, Reimar: *See*—
Schmelzer, Christoph; Spohr, Reimar; Krumme, Jens-Peter; Witter, Klaus; and Heitmann, Heinrich, 4,314,894, Cl. 204-192.00M.
Spoldi, Henry; and Sweeney, Joseph N. Subminiature audio transformer. 4,315,232, Cl. 336-90.000.
Spooner, Archer M., to Redifon Simulation Ltd. Visual display apparatus. 4,315,240, Cl. 340-27.00R.
Spooner, Archer M., to Redifon Simulation Limited. Visual display apparatus. 4,315,241, Cl. 340-27.00R.
Spotmanor Limited: *See*—
Shaw, John C. M., 4,314,527, Cl. 119-16.000.
Sprecker, Mark A.: *See*—
Wiegers, Wilhelmus J.; Sprecker, Mark A.; Watkins, Hugh; Vock, Manfred H.; and Schmitt, Frederick L., 4,314,915, Cl. 252-522.00R.
Spur, Miloslav: *See*—
Dolejsi, Ivan; and Spur, Miloslav, 4,314,822, Cl. 23-230.00B.
Spykerman, Jon J.: *See*—
Marez, Alejandro; and Spykerman, Jon J., 4,315,304, Cl. 363-49.000.
Stach, Leonard J., to Velsicol Chemical Corporation. Cyclic acetal-methyl-carbamoyl-methyl esters of phosphonic and phosphoric acids, as herbicides. 4,314,840, Cl. 71-87.000.
Stauffer Chemical Company: *See*—
Chin, Hsiao-Ling M.; and Pallos, Ferenc M., 4,315,030, Cl. 424-304.000.
Felix, Raymond A., 4,314,838, Cl. 71-67.000.
Scher, Herbert B., 4,314,841, Cl. 71-88.000.
Steelcase Inc.: *See*—
Faiks, Frederick S., 4,314,728, Cl. 297-300.000.
Steigmeier, Edgar F.; and Knop, Karl, to RCA Corporation. Defect detection system. 4,314,763, Cl. 356-237.000.
Steimel, Richard. Process for sequentially degreasing, tumbling, washing and drying objects. 4,314,856, Cl. 134-25.400.
Stein, Bernard; and Granoff, Richard A., to Instrumentation Laboratory Inc. Analysis system. 4,314,970, Cl. 422-72.000.
Steinberger, Helmut; Schonfelder, Manfred; Moretto, Hans-Heinrich; and Wegner, Christian, to Bayer Aktiengesellschaft. Coatings for thermoplastics. 4,315,091, Cl. 528-28.000.
Steinkamp, William E.; and Ballard, Ambrose H., to United States of America, Energy. Method for hot pressing irregularly shaped refractory articles. 4,314,961, Cl. 264-325.000.
Steinwand, Dennis D. Faucet structure. 4,314,580, Cl. 137-360.000.
Stenning, David G. C.: *See*—
Palmer, Harry E.; Stenning, David G. C.; and Crockett, Ray K., 4,314,776, Cl. 405-205.000.
Stevens, James W., to British Aerospace. Mechanical damage resistant members and electro-plating rubber or rubber-like material. 4,314,892, Cl. 204-38.00B.
Stewart, Lamar H.: *See*—
Beck, Boyd R.; Stewart, Lamar H.; Tapp, Steven; Anderson, Don L., Jr.; and Nuffer, Daniel E., 4,314,890, Cl. 203-1.000.
Stewart, Maxson L.; Odle, Robert R.; and Brunson, William W., to Southwire Company. Purification of nickel sulfate. 4,314,976, Cl. 423-139.000.
Stewart, Richard C.: *See*—
Brown, Karen K.; and Stewart, Richard C., 4,315,073, Cl. 435-5.000.
Stiebel Eltron GmbH & Co., KG: *See*—
Jansen, Harald; Oelert, Gerhard; and Kohnke, Hans-Jurgen, 4,314,668, Cl. 237-2.00B.
Stillwell, Peter F. T. C.; Moore, William T.; and Demaine, David G. A., to Rank Organisation Limited, The. Thermal scanning devices. 4,315,284, Cl. 358-209.000.
Stirnweiss, Peter: *See*—
Leibhard, Erich; Schiefer, Erwin; and Stirnweiss, Peter, 4,314,655, Cl. 222-146.0HE.
Stocker, Lester H., to Bell & Howell Company. Zip sort registration system. 4,314,644, Cl. 209-569.000.
Stoltz, Woodrow W. Internal pipe cleaning apparatus utilizing fluent abrasive. 4,314,427, Cl. 51-411.000.
Stone, Gregory M. Torque wrench with alarm indicator. 4,314,490, Cl. 81-479.000.
Stone, Orison W., to Pack Image, Inc. Returnable container having a central partition forming a return handle. 4,314,634, Cl. 206-167.000.
Stops, Manfred: *See*—
Kamp, Heinz; Becker, Rolf; and Stops, Manfred, 4,314,439, Cl. 57-270.000.
Storer, Richard, to Glaxo Group Limited. Benzoxocin derivatives having anxiolytic and anti-convulsant activities. 4,315,006, Cl. 424-250.000.
Stotts, Larry B.: *See*—
McKnight, William H.; Stotts, Larry B.; and Monahan, Michael A., 4,315,258, Cl. 340-784.000.
Streamway Corporation: *See*—
Schrock, Donald C., 4,314,581, Cl. 137-454.500.
Strosberg, Arthur M.: *See*—
Kluge, Arthur F.; Strosberg, Arthur M.; Whiting, Roger; and Christie, George A., 4,315,021, Cl. 424-273.00R.
Strubbe, Gilbert J. I.: *See*—
DeBusscher, Cyriel R. J.; and Strubbe, Gilbert J. I., 4,314,571, Cl. 130-27.200.
Studer, Philip A., to United States of America, National Aeronautics and Space Administration. Linear magnetic motor/generator. 4,315,197, Cl. 318-135.000.
Studsvik Energiteknik AB: *See*—
Spijkerman, Johan, 4,314,479, Cl. 73-643.000.
Styring, Ralph E., Jr., to Atlantic Richfield Company. Separating spent mineral matter from heat carriers. 4,314,899, Cl. 208-11.00R.
Sudo, Masatoshi; Higashi, Masanori; Ohki, Tsuguaki; and Kanbe, Shoji, to Kobe Steel, Ltd. Dual phase high strength cold-rolled steel plate. 4,314,862, Cl. 148-12.00F.
Sugita, Jitsuo: *See*—
Ito, Kanji; Ikawa, Kenji; Yukinaga, Hisajiro; and Sugita, Jitsuo, 4,314,845, Cl. 71-103.000.
Suito, Senji: *See*—
Kasahara, Takahiko; Yamaguchi, Tukasa; Shichi, Shigeharu; Kato, Masayuki; and Suito, Senji, 4,314,517, Cl. 112-260.000.
Sulzer Brothers Limited: *See*—
Fuchs, Rudolf, 4,314,463, Cl. 66-203.000.
Sulzer, Harry E., to Anchor/Darling Industries, Inc. Method and apparatus for testing snubbers in situ. 4,314,473, Cl. 73-11.000.
Sumi, Yoshiro: *See*—
Kitamura, Takashi; Sumi, Yoshiro; and Matsufuji, Akira, 4,314,469, Cl. 72-221.000.
Sumitomo Chemical Company, Limited: *See*—
Ueno, Katsuji; and Maruyama, Takashi, 4,315,086, Cl. 525-391.000.
Sumitomo Electric Industries, Ltd.: *See*—
Nakahara, Tsuneo; Yoshida, Kenichi; Tsuno, Koichi; and Isshiki, Isao, 4,315,245, Cl. 340-146.3AG.
Tsuji, Yoshiomi; Matsuda, Akio; Ikeda, Tamaki; and Mori, Kenji, 4,314,774, Cl. 405-115.000.
Sumitomo, Hiroyuki; Doi, Masafumi; Kobayashi, Kazuyuki; Fukami, Katsutoshi; and Kawanishi, Kenzo, to Hisaka Works Ltd. Condenser. 4,314,605, Cl. 165-110.000.
Sumitomo Metal Industries Limited: *See*—
Ito, Yoshinori; Ikeda, Masahiko; and Furuichi, Junji, 4,315,127, Cl. 219-73.100.
Sumizaki, Tuguo: *See*—
Uede, Kazuo; Sumizaki, Tuguo; and Nakamura, Masatoshi, 4,314,914, Cl. 252-472.000.
Sunada, Yoichi: *See*—
Takahashi, Yoshikazu; Sunada, Yoichi; and Takitani, Masaru, 4,315,090, Cl. 526-119.000.
Sundar, Parameschwaran S.; and Tiepel, Erich W., to Wyoming Mineral Corp. Method of aquifer restoration. 4,314,779, Cl. 405-263.000.
Sutton, Larry W.: *See*—
Morgan, John H.; and Sutton, Larry W., 4,315,133, Cl. 219-121.0FS.
Suyama, Tadakazu: *See*—
Uemura, Yahiro; Arimura, Hirofumi; Morise, Hiroshi; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,314,935, Cl. 260-112.00R.
Suzuki, Akiyoshi; Hiraga, Ryozo; Kano, Ichiro; Yoshinari, Hideki; Totsuka, Masao; Kato, Yuzo; and Ogino, Yasuo, to Canon Kabushiki Kaisha. Alignment apparatus for mask and wafer used in manufacturing semiconductor circuit elements. 4,315,201, Cl. 318-640.000.
Suzuki, Hajime; Umemura, Yoshifumi; Kimbara, Masahiko; and Iwano, Yoshimi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Weft guiding comb for a jet loom. 4,314,590, Cl. 139-435.000.
Suzuki, Kinzo: *See*—
Sendo, Masaaki; and Suzuki, Kinzo, 4,315,176, Cl. 310-83.000.
Suzuki, Masaaki: *See*—
Noyori, Ryoji; Suzuki, Masaaki; and Kurozumi, Seizi, 4,315,032, Cl. 424-317.000.
Suzuki, Yasuo: *See*—
Mochida, Ei; Suzuki, Yasuo; Onishi, Haruo; and Kosuzume, Hiroshi, 4,315,003, Cl. 424-226.000.
Suzumura, Yoshikazu: *See*—
Kyomasu, Ryuichi; Hanashima, Shuichi; and Suzumura, Yoshikazu, 4,315,199, Cl. 318-601.000.
Svendsen, Peter R.: *See*—
Bernett, Frank W.; and Svendsen, Peter R., 4,315,288, Cl. 360-98.000.

Swanson, Arthur P. Putter club. 4,314,701, Cl. 273-164.000.
Swanson, William A. Omnidirectional solar collector. 4,314,549, Cl. 126-449.000.
Sweeney, Joseph N.: *See—*
Spoldi, Henry; and Sweeney, Joseph N., 4,315,232, Cl. 336-90.000.
Swenck, George F.: *See—*
Goolsby, Patrick F.; and Swenck, George F., 4,314,397, Cl. 29-157.30R.
Swithenbank, Colin; and Fujimoto, Ted T., to Rohm and Haas Company. Herbicidal substituted imidazoles. 4,314,844, Cl. 71-92.000.
Sybron Corporation: *See—*
Grunert, Hans C., 4,314,734, Cl. 312-322.000.
Nunlist, Erwin J.; Coleman, Howard G.; and Harrison, Edward S., 4,314,396, Cl. 29-156.80R.
Syntex (U.S.A.) Inc.: *See—*
Kluge, Arthur F.; Strosberg, Arthur M.; Whiting, Roger; and Christie, George A., 4,315,021, Cl. 424-273.00R.
Synthelabo: *See—*
Manoury, Philippe M., 4,315,007, Cl. 424-251.000.
Szabo, Lajos: *See—*
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; and Drexler, Ferenc, 4,314,939, Cl. 260-239.30P.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyoorgy; Dancsi, Lajos; Keve, Tibor; Karpati, Egon; and Szporny, Laszlo, 4,315,011, Cl. 424-262.000.
Szalvay, Laszlo: *See—*
Broyles, Harry C.; and Szalvay, Laszlo, 4,314,718, Cl. 285-114.000.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; and Drexler, Ferenc, to Richter Gedeon Vegyeszeti Gyar Rt. Process for the preparation of 15-hydroxyimino-E-homoeburnane and intermediates therefor. 4,314,939, Cl. 260-239.30P.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyoorgy; Dancsi, Lajos; Keve, Tibor; Karpati, Egon; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar Rt. 1-Alkyl-9-bromohexahydroindolo quinolizium salts and use thereof to increase blood flow. 4,315,011, Cl. 424-262.000.
Sze, Mei S.: *See—*
Lin, Frank W.; and Sze, Mei S., 4,315,198, Cl. 318-594.000.
Szporny, Laszlo: *See—*
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyoorgy; Dancsi, Lajos; Keve, Tibor; Karpati, Egon; and Szporny, Laszlo, 4,315,011, Cl. 424-262.000.
Szretter, Marta: *See—*
Pigeon, Marcel; Szretter, Marta; and Perie, Chantal, 4,315,065, Cl. 430-175.000.
Tabb, Leroy, Jr.: *See—*
Hodge, Malcolm H.; and Tabb, Leroy, Jr., 4,314,760, Cl. 356-4.000.
Tabuchi, Toshiaki: *See—*
Osaki, Mikio; Kamada, Hiroshi; Kakimoto, Kohichi; and Tabuchi, Toshiaki, 4,315,322, Cl. 364-900.000.
Tachi, Susumu: *See—*
Tanie, Kazuo; and Tachi, Susumu, 4,314,379, Cl. 3-1.100.
Tagami, Ichizo, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Apparatus for detecting the relative position of two movable bodies. 4,315,252, Cl. 340-347.00P.
Tague, B. Dale: *See—*
Parmerlee, James K.; and Tague, B. Dale, 4,315,300, Cl. 361-382.000.
Takada, Juichiro. Inertia responsive actuating device for safety belt retractors. 4,314,680, Cl. 242-107.40A.
Takada, Shigetaka: *See—*
Takeuchi, Yuzu; Takada, Shigetaka; and Morino, Toshiharu, 4,314,535, Cl. 123-439.000.
Takagi, Motoyoshi, to Bio Research Center Company Ltd. Method for the treatment of cellulosic substances with hydrogen peroxide. 4,314,854, Cl. 127-37.000.
Takahashi, Hiroshi: *See—*
Motosugi, Katsuhiko; Takahashi, Hiroshi; Toyoda, Shuhei; Konomi, Toshiaki; and Matsui, Hideaki, 4,314,529, Cl. 123-52.0MB.
Takahashi, Michio: *See—*
Miyamori, Tamotsu; Kaji, Hisatsugu; Kameyama, Iwao; and Takahashi, Michio, 4,314,981, Cl. 423-447.700.
Takahashi, Noboru; Ozaki, Sadao; Isono, Hiromasa; Nishihara, Toshikazu; Ikushima, Takeshi; and Naruse, Tunehide, to Victor Company of Japan, Limited. Magnetic recording medium. 4,315,052, Cl. 428-328.000.
Takahashi, Yoshikazu; Sunada, Yoichi; and Takitani, Masaru, to Toyo Stauffer Chemical Co., Ltd. Titanium trichloride catalytic component and method for homo- or co-polymerization of α-olefin. 4,315,090, Cl. 526-119.000.
Takayanagi, Takeo: *See—*
Ishida, Toshimichi; Takayanagi, Takeo; and Taki, Yasuo, 4,314,870, Cl. 156-272.000.
Takeda Chemical Industries, Ltd.: *See—*
Yamamura, Yuichi; Hasegawa, Akira; Azuma, Ichiro; and Kobayashi, Shigeru, 4,314,998, Cl. 424-177.000.
Takeda Riken Kogyo Kabushiki Kaisha: *See—*
Honjyo, Jun; and Watanabe, Yukimitsu, 4,315,254, Cl. 340-347.0CC.
Takeshima, Masaki: *See—*
Saito, Toru; and Takeshima, Masaki, 4,314,828, Cl. 55-26.000.
Takeuchi, Masami: *See—*
Tominaga, Tamotsu; Mihara, Teruyoshi; Oguro, Takeshi; and Takeuchi, Masami, 4,315,236, Cl. 338-4.000.
Takeuchi, Misao: *See—*
Kanamaru, Koichi; and Takeuchi, Misao, 4,315,116, Cl. 200-61.090.
Takeuchi, Yuzu; Takada, Shigetaka; and Morino, Toshiharu, to Aisan Industry Co., Ltd. Feedback type variable venturi carburetor. 4,314,535, Cl. 123-439.000.
Taki, Yasuo: *See—*
Ishida, Toshimichi; Takayanagi, Takeo; and Taki, Yasuo, 4,314,870, Cl. 156-272.000.
Takitani, Masaru: *See—*
Takahashi, Yoshikazu; Sunada, Yoichi; and Takitani, Masaru, 4,315,090, Cl. 526-119.000.
Tamai, Yoshin: *See—*
Mori, Fumio; Omura, Yoshiaki; Fujita, Yoshiji; Nishida, Takashi; Hosogai, Takeo; Wada, Fumio; Aihara, Sukeji; Tamai, Yoshin; and Itoi, Kazuo, 4,315,029, Cl. 424-304.000.
Tamura, Hideyuki: *See—*
Asano, Masaharu; Tamura, Hideyuki; and Furuhashi, Shoji, 4,314,537, Cl. 123-440.000.
Tamura, Joji, to Yamaha Hatsudoki Kabushiki Kaisha. Suspension mechanism for tracked vehicles. 4,314,618, Cl. 180-193.000.
Tamura, Masaaki: *See—*
Nakako, Yukio; Ohzawa, Toshio; Yokota, Shizuo; and Tamura, Masaaki, 4,314,898, Cl. 208-8.0LE.
Tamura, Shuichi: *See—*
Niwa, Yukichi; Owada, Mitsutoshi; Asano, Noriyuki; Ogawa, Masahiko; and Tamura, Shuichi, 4,315,159, Cl. 250-578.000.
Tanaka, Hideki: *See—*
Kamejima, Kohji; Kano, Minoru; Tanaka, Hideki; and Fukushima, Toshihiko, 4,314,454, Cl. 62-98.000.
Tanaka, Kazuo: *See—*
Kuwayama, Tetsuro; and Tanaka, Kazuo, 4,315,279, Cl. 358-44.000.
Tanie, Kazuo; and Tachi, Susumu, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Apparatus for discrimination of myoelectric potential patterns. 4,314,379, Cl. 3-1.100.
Taniguchi, Kiyoshi: *See—*
Kunikane, Makoto; Umehara, Masaakira; Uji-Ie, Koji; and Taniguchi, Kiyoshi, 4,315,068, Cl. 430-341.000.
Tapp, Steven: *See—*
Beck, Boyd R.; Stewart, Lamar H.; Tapp, Steven; Anderson, Don L., Jr.; and Nuffer, Daniel E., 4,314,890, Cl. 203-1.000.
Tassoni, Bruno: *See—*
Sauer, Alfred E.; and Tassoni, Bruno, 4,314,389, Cl. 24-376.000.
Tate, Lemmie D.: *See—*
Bullington, John G.; and Tate, Lemmie D., 4,314,543, Cl. 126-201.000.
Tausig, Wayne R., to United States of America, Navy. Seafloor attachment bolts. 4,314,784, Cl. 411-57.000.
Tavel, Donald L.: *See—*
Beigel, Michael L., 4,314,496, Cl. 84-1.260.
Taylor, Jack D.: *See—*
Smith, Kenneth V.; and Taylor, Jack D., 4,314,934, Cl. 260-45.75S.
Taylor, Jerry A.: *See—*
Williams, Rodney B.; and Taylor, Jerry A., 4,314,788, Cl. 414-425.000.
Tazaki, Shigemitsu, to Canon Kabushiki Kaisha. Recording apparatus. 4,315,268, Cl. 346-17.000.
TDK Electronics Co., Ltd.: *See—*
Horigome, Eiji; Azegami, Hitoshi; and Ohta, Hiroshi, 4,315,057, Cl. 428-694.000.
Teass, Horace A., Jr.: *See—*
Binder, Ira; and Teass, Horace A., Jr., 4,314,896, Cl. 204-195.00R.
Teitin Limited: *See—*
Noyori, Ryoji; Suzuki, Masaaki; and Kurozumi, Seizi, 4,315,032, Cl. 424-317.000.
Telatemp Corporation: *See—*
Darringer, Richard E.; Scharf, Wayne L.; and Haggerty, James S., 4,315,150, Cl. 250-338.000.
Telediffusion de France & Compagnie Continentale de Signalisation: *See—*
Hernandez, Charles, 4,315,257, Cl. 340-723.000.
Teledyne Industries, Inc.: *See—*
Barbeau, Dennis E., 4,314,443, Cl. 60-39.360.
Terauchi, Kiyoshi, to Sankyo Electric Company Limited. Scroll-type compressor with thrust bearing lubricating and bypass means. 4,314,796, Cl. 417-294.000.
Terumo Corporation: *See—*
Sagae, Kyuta, 4,314,555, Cl. 128-214.400.
Teshima, Takashi: *See—*
Miyakawa, Nobuhiro; and Teshima, Takashi, 4,315,064, Cl. 430-122.000.
Tessier, Jean: *See—*
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,315,012, Cl. 424-263.000.
Tessier, Raymond J.: *See—*
Skiven, David A.; Sortor, Charles J.; and Tessier, Raymond J., 4,314,830, Cl. 55-217.000.
Texaco Development Corporation: *See—*
Schulze, Heinz; Zimmerman, Robert L.; and Waddill, Harold G., 4,315,079, Cl. 521-115.000.
Texas Woods Instruments, Inc.: *See—*
Bull, James E., 4,314,446, Cl. 60-279 000.
Texasgulf Inc.: *See—*
Franklin, John C., 4,314,978, Cl. 423-320.000.
Textilma AG: *See—*
Speich, Francisco, 4,314,588, Cl. 139-79.000.

Thau, Frederick E.: *See*—
Boros, Victor B.; and Thau, Frederick E., 4,315,316, Cl. 364-483.000.

Theiler, Richard F., to Armour and Company. Process for preparing cooked bacon having reduced levels of N-nitrosamines. 4,315,015, Cl. 426-266.000.

Theodore, Frank W.; and Wasson, George E., to Conoco Inc. Method for producing distillable hydrocarbonaceous fuels and carbonaceous agglomerates from a heavy crude oil. 4,314,900, Cl. 208-126.000.

Theymann, Walter: *See*—
Fritz, Rolf; Schoening, Josef; Elter, Claus; and Theymann, Walter, 4,314,883, Cl. 376-381.000.

Theysohn, Rainer; and Reimann, Horst, to BASF Aktiengesellschaft. Flameproofed filled nylon molding materials. 4,314,927, Cl. 260-37.00N.

Thiebaut, Jean: *See*—
Lapeyre, Guy; and Thiebaut, Jean, 4,314,766, Cl. 366-101.000.

Thiokol Corporation: *See*—
Millen, Edward G., 4,314,920, Cl. 260-24.000.

Thomas, Charles A. Hearing aid with remote momentary shut off switch. 4,315,111, Cl. 179-107.00R.

Thomas, David L.; and Hackman, Donald J., to Battelle Development Corporation. Hydraulic linear impact tool. 4,314,612, Cl. 173-119.000.

Thomas J. Lipton, Inc.: *See*—
Kelly, Thomas R., 4,315,037, Cl. 426-421.000.

Thomson-CSF: *See*—
Bert, Alain; Leclerc, Bernard; and Archambault, Yves, 4,315,275, Cl. 357-56.000.
Gazard, Maryse; Eranian, Armand; Barre, Francoise; and Duchesne, Claude, 4,315,067, Cl. 430-296.000.
Reymond, Jean C.; Hidalgo, Jean L.; and Skenderoff, Claude, 4,314,761, Cl. 356-141.000.
Saint Marcoux, Roland; and Fink, Leon, 4,315,299, Cl. 361-274.000.

Thornburg, David D.: *See*—
Lloyd, William A.; and Thornburg, David D., 4,315,270, Cl. 346-155.000.

Thornton, William A., to Westinghouse Electric Corp. High-pressure mercury-vapor lamp which has both improved color rendition and light output. 4,315,193, Cl. 313-487.000.

Tiepel, Erich W.: *See*—
Sundar, Parameschwaran S.; and Tiepel, Erich W., 4,314,779, Cl. 405-263.000.

Tipton, Larry J., to ACF Industries, Inc. Pulsing solenoid improvement. 4,314,536, Cl. 123-440.000.

Titanium Metals Corporation of America: *See*—
Mede, John J., 4,314,725, Cl. 295-11.000.

Tjurkina, Ljudmila P.: *See*—
Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Beloloskov, Valentin I.; and Plotnikov, Vladimir P., 4,314,975, Cl. 423-81.000.

Toderi, Nando: *See*—
Senni, Paolo; and Toderi, Nando, 4,314,940, Cl. 260-239.30A.

Todoroki, Tsunehiko; and Hirohata, Hyogo, to Matsushita Electric Industrial Co., Ltd. Silver alloy for a sliding contact. 4,314,848, Cl. 75-173.00C.

Tokoku University, The President of: *See*—
Onodera, Yutaka; and Yamashita, Tsutomu, 4,315,215, Cl. 324-248.000.

Tokugawa, Fumitake; and Hatabe, Etsuo, to Mitsubishi Denki Kabushiki Kaisha. Thermal recording head. 4,315,135, Cl. 219-216.000.

Tokunaga, Michio; Okada, Ryoichi; Mizutani, Hideo; Hasegawa, Koichi; and Osaki, Takaaki, to Nippon Telegraph and Telephone Public Corporation; Oki Electric Industry Co., Ltd.; Nippon Electric Co., Ltd.; Fujitsu Ltd.; and Hitachi, Ltd. Current supply circuit for telephone exchange. 4,315,206, Cl. 323-265.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Gamoh, Ryouji, 4,315,212, Cl. 324-142.000.
Hirano, Tomiyoshi; Shinada, Hidehiro; and Sawada, Michiyuki, 4,315,186, Cl. 313-111.000.
Miwa, Yoshiyuki, 4,315,138, Cl. 219-441.000.
Onishi, Masayuki; and Miwa, Yoshiyuki, 4,315,139, Cl. 219-441.000.
Shimizu, Shyoichi; and Torii, Ken-Ichi, 4,315,165, Cl. 307-225.00R.

Tol, Franciscus; and Baggermans, Albertus B. A., to U.S. Philips Corporation. High-voltage generating device. 4,315,306, Cl. 363-126.000.

Tomasetta, Louis R.; and Law, H. David, to Rockwell International Corporation. Method of making a fully integrated monolithic optical receiver. 4,314,858, Cl. 148-1.500.

Tominaga, Jiro, to Nippon Steel Corporation. Method for direct heat treating hot rolled steel wire rod. 4,314,860, Cl. 148-12.00B.

Tominaga, Tamotsu; Mihara, Teruyoshi; Oguro, Takeshi; and Takeuchi, Masami, to Nissan Motor Company, Limited. Pressure sensor. 4,315,236, Cl. 338-4.000.

Tomlin, Malcolm G.: *See*—
Plumpton, Norman A.; and Tomlin, Malcolm G., 4,314,730, Cl. 299-75.000.

Tomosada, Masahiro: *See*—
Shimizu, Katsuichi; Sawamura, Osamu; Masuda, Shunichi; Tomosada, Masahiro; and Sakamaki, Hisashi, 4,314,754, Cl. 355-14.00C

Tonnaer, Henricus L. M.: *See*—
Konijnendijk, Willem L.; Boogerd, Gert M.; and Tonnaer, Henricus L. M., 4,315,191, Cl. 313-486.000.

Torii, Ken-Ichi: *See*—
Snimizu, Shyoichi; and Torii, Ken-Ichi, 4,315,165, Cl. 307-225.00R.

Torisawa, Akira; Ueda, Makoto; and Shida, Masaharu, to Kabushiki Kaisha Daini Seikosha. Load measuring device for the gear train of a timepiece. 4,315,329, Cl. 368-76.000.

Torrington Company, The: *See*—
Murphy, William W., 4,314,732, Cl. 308-2.00R.

Toshiba Corporation: *See*—
Goto, Yasumasa; and Ozaki, Junichi, 4,315,189, Cl. 313-405.000.

Totsuka, Masao: *See*—
Suzuki, Akiyoshi; Hiraga, Ryozo; Kano, Ichiro; Yoshinari, Hideki; Totsuka, Masao; Kato, Yuzo; and Ogino, Yasuo, 4,315,201, Cl. 318-640.000.

Touret, Jean P., to Rockwell-Rimoldi, S.p.A. Workpiece guide for sewing machines. 4,314,516, Cl. 112-152.000.

Townend, Rodney; Wareing, Joseph B.; and Winstanley, Raymond, to Electricity Council, The. Electron discharge heating devices. 4,315,131, Cl. 219-121.0EB.

Townsley, Phillip M.; and Weaver, Robert L., to Molson Companies Limited, The. Process for preparing protein flour from brewery waste. 4,315,038, Cl. 426-430.000.

Toyad Corporation: *See*—
Gardner, Esther C., 4,315,075, Cl. 521-71.000.

Toyo Stauffer Chemical Co., Ltd.: *See*—
Takahashi, Yoshikazu; Sunada, Yoichi; and Takitani, Masaru, 4,315,090, Cl. 526-119.000.

Toyoda, Shuhei: *See*—
Motosugi, Katsuhiko; Takahashi, Hiroshi; Toyoda, Shuhei; Konomi, Toshiaki; and Matsui, Hideaki, 4,314,529, Cl. 123-52.0MB.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Motosugi, Katsuhiko; Takahashi, Hiroshi; Toyoda, Shuhei; Konomi, Toshiaki; and Matsui, Hideaki, 4,314,529, Cl. 123-52.0MB.

Trabitzsch, Hans: *See*—
Monsheimer, Rolf; Pfleiderer, Ernst; Siol, Werner; Boessler, Hanns; and Trabitzsch, Hans, 4,314,800, Cl. 8-94.10R.

Transagra Corporation: *See*—
Fedde, Paul A.; Ghosh, Sambhunath; Henry, Michael P.; and Klass, Donald L., 4,314,904, Cl. 210-611.000.

Trelleborg Marin Aktiebolag: *See*—
Lundberg, Hans G., 4,314,521, Cl. 114-222.000.

Tri-State Oil Tool Industries, Inc.: *See*—
Richardson, Charles N., 4,314,608, Cl. 166-250.000.

Triatik, Jerome J.: *See*—
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White, Stanley A., to Rockwell International Corporation. Non-linear signal processor. 4,315,319, Cl. 364-571.000.
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Orchard, Richard D.; Barbee, Kurt L.; Whiting, Bradford S.; Heussy, William C., deceased; and Pavenstedt, Loyal L., executrix, 4,315,317, Cl. 364-510.000.
Whiting, Roger: *See*—
Kluge, Arthur F.; Strosberg, Arthur M.; Whiting, Roger; and Christie, George A., 4,315,021, Cl. 424-273.00R.
Whitman, C. I.: *See*—
Ro, David H.; Klar, Erhard; and Whitman, C. I., 4,314,849, Cl. 75-228.000.
Wichall, Colin A., to Crane Packing Limited. Rotary mechanical face seals. 4,314,704, Cl. 277-27.000.
Widmer, Colin F., to James Brown & Sons. Cooling elements for furnaces. 4,314,695, Cl. 266-194.000.
Wieder, Herman H.; and Parkerson, Charles R., to United States of America, Navy. Method for depositing heteroepitaxially InP on GaAs semi-insulating substrates. 4,314,873, Cl. 156-610.000.
Wiegers, Wilhelmus J.; Sprecker, Mark A.; Watkins, Hugh; Vock, Manfred H.; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. Uses in perfumery of ether derivatives of indanes. 4,314,915, Cl. 252-522.00R.
Wijnendaele, Frans V., to Smithkline-RIT. Immunogenic *E. coli* ST enterotoxin derivatives and compositions containing them. 4,314,993, Cl. 424-92.000.
Wild, Gerhard: *See*—
Muller, Walter; Gauer, Richard; Walkenhorst, Wilfried; and Wild, Gerhard, 4,314,606, Cl. 165-163.000.
Wilkinson, Harold C.; D'Attoma, Angelo M.; and Walker, Stephen W., to Omark Industries, Inc. Mobile apparatus for welding studs to rail base plates. 4,315,129, Cl. 219-99.000.
Willemin Machines S.A.: *See*—
Willemin, Paul, 4,314,781, Cl. 409-96.000.
Willemin, Paul, to Willemin Machines S.A. Copying machine with an optic reading device. 4,314,781, Cl. 409-96.000.
Williams, Rodney B.; and Taylor, Jerry A. Crop handling apparatus. 4,314,788, Cl. 414-425.000.
Williamson, David G.: *See*—
Norman, John H.; and Williamson, David G., 4,314,982, Cl. 423-539.000.
Willinger, Allan H.; and Itakura, Tsuyoshi. Aquarium heater. 4,315,143, Cl. 219-523.000.
Willis, Charles R.: *See*—
Ezekiel, Shaoul; Leiby, Clare C.; Picard, Richard H.; Willis, Charles R.; and Hackel, Richard P., 4,315,224, Cl. 331-3.000.
Willis, Clyde A., to Walker-Neer Manufacturing Co., Inc. Apparatus for supporting and rotating a down hole tubular. 4,314,611, Cl. 173-57.000.
Wilputte Corporation: *See*—
Corbman, Philip; and Faber, Paul V., 4,314,888, Cl. 202-143.000.
Wilson, James W.: *See*—
Huffman, William F.; and Wilson, James W., 4,314,944, Cl. 260-326.150.
Wilson, Michael E., to Racor Industries, Inc. Drain valve. 4,314,689, Cl. 251-351.000.
Wilson, Terrance J. Computer tape drive and cleaner apparatus. 4,315,294, Cl. 360-137.000.
Wimmenauer, Dirk: *See*—
Lueg, Heinz; Blackert, Hanno; Wimmenauer, Dirk; and Hermanns, Winfried, 4,315,242, Cl. 340-38.00L.
Wimsatt, James M.; and Lynch, Patrick E., Jr., to WLN Products. Carpet cleaning system. 4,314,385, Cl. 15-321.000.
Winkler, Thomas J., to Nortronics Company, Inc. Transducer protection guide for diskette insertion and removal. 4,315,293, Cl. 360-130.200.
Winstanley, Raymond: *See*—
Townend, Rodney; Wareing, Joseph B.; and Winstanley, Raymond, 4,315,131, Cl. 219-121.0EB.
Wischer, Hermann: *See*—
Sommer, Ruediger; and Wischer, Hermann, 4,315,285, Cl. 358-280.000.
Wisner, Winifred: *See*—
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Wisyanski, Thomas W. Thermostat assembly. 4,314,664, Cl. 236-34.500.
Witter, Klaus: *See*—
Schmelzer, Christoph; Spohr, Reimar; Krumme, Jens-Peter; Witter, Klaus; and Heitmann, Heinrich, 4,314,894, Cl. 204-192.00M.
WLN Products: *See*—
Wimsatt, James M.; and Lynch, Patrick E., Jr., 4,314,385, Cl. 15-321.000.
"Wohn-Art" Freizeitartikel Gesellschaft m.b.H.: *See*—
Artweger, Wolfgang; and Reitz, Otfried, 4,314,726, Cl. 296-164.000.
Wolak, David J.: *See*—
Riewerts, Paul R.; and Wolak, David J., 4,314,610, Cl. 172-776.000.
Wolak, Paul Z.: *See*—
Gordon, Robert L.; and Wolak, Paul Z., 4,314,638, Cl. 206-427.000.
Wolf, Horst: *See*—
Hartmannsgruber, Max; and Wolf, Horst, 4,314,388, Cl. 19-293.000.
Wolfer, Peter; Derrer, Hans-Rudolf; Vollenweider, Max; and Sonderegger, Hans-Conrad, to Kistler Instruments AG. Piezeolectric strain transducer. 4,314,481, Cl. 73-774.000.
Wolff, Manfred, to Robert Bosch GmbH. Method for obtaining an acceleration or deceleration signal from a signal proportional to speed and apparatus therefor. 4,315,213, Cl. 324-162.000.
Wolfrey, Austin A., to General Electric Company. High-solids epoxy prepolymer coating composition. 4,314,917, Cl. 260-18.0EP.
Wollensak, John C.; and Ihrman, Kryn G., to Ethyl Corporation. Phenol extended polyurethanes prepared by RIM process. 4,314,962, Cl. 264-328.600.
Woodland, Sylvester L.: *See*—
Perkins, Joseph R., III; and Woodland, Sylvester L., 4,314,645, Cl. 209-638.000.
Wootton, Gordon; and Smith, Stephen A., to Beecham Group Limited. Terminal amino prostaglandin analogues. 4,315,022, Cl. 424-273.00R.
Wu, Peter T. K., to United States of America, Energy. Reactor control rod timing system. 4,314,881, Cl. 376-245.000.
Wulff, Guenter: *See*—
Naarmann, Herbert; Wulff, Guenter; and Akelah, Ahmed, 4,315,089, Cl. 526-89.000.
Wurst, John W.; and Beckerman, Howard L., to Singer Company, The. Connection arrangement for selection and display system. 4,315,250, Cl. 340-286.00R.
Wust, Reinhold: *See*—
Heine, Christian; Ploog, Uwe; and Wust, Reinhold, 4,315,040, Cl. 426-609.000.
Wyler, John S., to General Electric Company. Mass rate of flow meter with improved temperature characteristics. 4,314,483, Cl. 73-861.350.
Wyoming Mineral Corp.: *See*—
Sundar, Parameschwaran S.; and Tiepel, Erich W., 4,314,779, Cl. 405-263.000.
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Hoffend, Thomas R.; and Levy, Moshe, 4,314,931, Cl. 260-42.530.
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Yakusheva, Galina G.: *See*—
Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Belokoskov, Valentin I.; and Plotnikov, Vladimir P., 4,314,975, Cl. 423-81.000.
Yamada, Yasuaki; Ozawa, Toshiaki; and Kondo, Hiroatsu, to Canon Kabushiki Kaisha. Servo control apparatus. 4,315,200, Cl. 318-603.000.
Yamada, Yukio: *See*—
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Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Tamura, Joji, 4,314,618, Cl. 180-193.000.
Yamamoto, Kaneo; Nakamura, Hiroshi; and Konno, Toshio, to Victor Company of Japan, Limited. Compound semiconductor Hall effect element. 4,315,273, Cl. 357-27.000.
Yamamoto, Kazuhiko; Matsushita, Yoshiaki; Kanamori, Masaru; Nagasawa, Kazutoshi; Yoshihiro, Naotsugu; and Kishino, Seigo, to VLSI Technology Research Association. Method of forming nondefective zone in silicon single crystal wafer by two stage-heat treatment. 4,314,595, Cl. 148-1.500.
Yamamoto, Kunio: *See*—
Watanabe, Takashi; Yamano, Katsushi; Yamamoto, Kunio; and Inomata, Shigeo, 4,314,850, Cl. 106-15.050.
Yamamura, Yuichi; Hasegawa, Akira; Azuma, Ichiro; and Kobayashi, Shigeru, to Takeda Chemical Industries, Ltd. 6-Deoxyglucosamine-peptide derivatives, their production and use. 4,314,998, Cl. 424-177.000.
Yamano, Katsushi: *See*—
Watanabe, Takashi; Yamano, Katsushi; Yamamoto, Kunio; and Inomata, Shigeo, 4,314,850, Cl. 106-15.050.
Yamashita, Hideo, to Nippon Gakki Seizo Kabushiki Kaisha. Piano construction for enriched stereophonic tonal radiation. 4,314,497, Cl. 84-177.000.
Yamashita, Sadahiko; Onishi, Hiroshi; Saito, Mitsuo; and Sagawa, Morikazu, to Matsushita Electric Industrial Company, Limited. Circuit arrangement for a wide-band VHF-UHF television double superheterodyne receiver. 4,315,333, Cl. 455-189.000.
Yamashita-Shinnihon Steamship Co., Ltd.: *See*—
Yunoki, Shigeto; and Makizono, Masataka, 4,314,519, Cl. 114-125.000.
Yamashita, Tsutomu: *See*—
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Yamauchi, Takashi: *See*—
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Yamazaki, Shozo: *See*—
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Yanai, Genzo: *See*—
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Yanai Seiko Company Limited: *See*—
Saegusa, Nobuaki; Sakaki, Masakatsu; and Yanai, Genzo, 4,314,472, Cl. 72-341.000.
Yancy, Mark E. Sailboat wind direction indicator. 4,314,477, Cl. 73-188.000.
Yang, Ralph T.: *See*—
Shen, Ming-Shing; Chen, James M.; and Yang, Ralph T., 4,314,980, Cl. 423-331.000.
Yannone, Robert A.; and Shields, James J., to Westinghouse Electric Corp. Gas turbine power plant control apparatus including an ambient temperature responsive control system. 4,314,441, Cl. 60-39.28R.
Yaron, Arieh; and Carmel, Amos, to Yeda Research and Development Co., Ltd. Substrates for the quantitative assay of enzymes and such assay. 4,314,936, Cl. 260-112.50R.
Yeda Research and Development Co., Ltd.: *See*—
Yaron, Arieh; and Carmel, Amos, 4,314,936, Cl. 260-112.50R.
Yokota, Shizuo: *See*—
Nakako, Yukio; Ohzawa, Toshio; Yokota, Shizuo; and Tamura, Masaaki, 4,314,898, Cl. 208-8.0LE.
Yoneda, Kenji: *See*—
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Yoshida, Keiichiro. Roller die wire drawing device having a plurality of roller die units. 4,314,470, Cl. 72-234.000.
Yoshida, Kenichi: *See*—
Nakahara, Tsuneo; Yoshida, Kenichi; Tsuno, Koichi; and Isshiki, Isao, 4,315,245, Cl. 340-146.3AG.
Yoshida, Toru: *See*—
Ueda, Yuziro; Yoshida, Toru; and Honda, Michiyasu, 4,314,694, Cl. 266-44.000.
Yoshida, Yoshiaki: *See*—
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Yoshihiro, Naotsugu: *See*—
Yamamoto, Kazuhiko; Matsushita, Yoshiaki; Kanamori, Masaru; Nagasawa, Kazutoshi; Yoshihiro, Naotsugu; and Kishino, Seigo, 4,314,595, Cl. 148-1.500.
Yoshimitsu, Arata: *See*—
Murakami, Shinichi; Nishihara, Hisakatsu; Yoshimitsu, Arata; and Noji, Sueyoshi, 4,314,861, Cl. 148-12.00E.
Yoshinari, Hideki: *See*—
Suzuki, Akiyoshi; Hiraga, Ryozo; Kano, Ichiro; Yoshinari, Hideki; Totsuka, Masao; Kato, Yuzo; and Ogino, Yasuo, 4,315,201, Cl. 318-640.000.
Young, Robert G.: *See*—
Skwirut, Henry; and Young, Robert G., 4,315,192, Cl. 313-487.000.
Yuasa Battery Company Limited: *See*—
Sanekata, Nobuo, 4,314,403, Cl. 29-730.000.
Yukinaga, Hisajiro: *See*—
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Yunoki, Shigeto; and Makizono, Masataka, to Yamashita-Shinnihon Steamship Co., Ltd. Ballast pumping system. 4,314,519, Cl. 114-125.000.
Zawidzki, Tadeusz W., to Eldorado Nuclear Limited. Process of preparing sintered urandium dioxide pellets. 4,314,952, Cl. 264-0.500.
Zeeh, Bernd: *See*—
Linhart, Friedrich; Zeeh, Bernd; and Adolphi, Heinrich, 4,315,017, Cl. 424-269.000.
Zell, Michael N.: *See*—
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Zimmerman, Robert L.: *See*—
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Zinser Textilmaschinen GmbH: *See*—
Hartmannsgruber, Max; and Wolf, Horst, 4,314,388, Cl. 19-293.000.
Zocholl, Stanley E., to Gould Inc. Timing circuit for an overcurrent relay. 4,315,295, Cl. 361-96.000.
Zrostlik, Francis L.; and Collins, John J., to Iowa Mold Tooling Co., Inc. Tire mounting and demounting apparatus and method. 4,314,597, Cl. 157-1.110.
Zumfeld, Heinz: *See*—
Rohner, Joachim; and Zumfeld, Heinz, 4,314,437, Cl. 57-22.000.
Zuuring, Peter F., to PFZ Enterprises Inc. Ice skate blade. 4,314,708, Cl. 280-11.180.

# LIST OF REISSUE PATENTEES

## TO WHOM

## PATENTS WERE ISSUED ON THE 9TH DAY OF FEBRUARY, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ahn, Byung K.: *See—*
Justice, David D.; Ahn, Byung K.; and Dotson, Ronald L., Re. 30,864, Cl. 204-98.000.

Dotson, Ronald L.: *See—*
Justice, David D.; Ahn, Byung K.; and Dotson, Ronald L., Re. 30,864, Cl. 204-98.000.

Justice, David D.; Ahn, Byung K.; and Dotson, Ronald L., to Olin Corporation. Process for electrolysis in a membrane cell employing pressure actuated uniform spacing. Re. 30,864, Cl. 204-98.000.

Keller, Wolfgang, to Siemens Aktiengesellschaft. Method for crucible-free zone meeting of semiconductor crystal rods. Re. 30,863, Cl. 156-620.000.

Krawagna, Alois A., to Westhem Corporation Limited. Biased hinges. Re. 30,861, Cl. 16-293.000.

Kruzic, Zelko J.: *See—*
Mrenna, Stephen A.; and Kruzic, Zelko J., Re. 30,862, Cl. 339-258.00R.

Mrenna, Stephen A.; and Kruzic, Zelko J., to Westinghouse Electric Corp. Rejection-type fuse clip. Re. 30,862, Cl. 339-258.00R.

Olin Corporation: *See—*
Justice, David D.; Ahn, Byung K.; and Dotson, Ronald L., Re. 30,864, Cl. 204-98.000.

Siemens Aktiengesellschaft: *See—*
Keller, Wolfgang, Re. 30,863, Cl. 156-620.000.

Westhem Corporation Limited: *See—*
Krawagna, Alois A., Re. 30,861, Cl. 16-293.000.

Westinghouse Electric Corp.: *See—*
Mrenna, Stephen A.; and Kruzic, Zelko J., Re. 30,862, Cl. 339-258.00R.

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# LIST OF DESIGN PATENTEES

Aavid Engineering, Inc.: *See—*
Johnson, Philip A.; and McCarthy, Alfred F., 262,960, Cl. D13-23.000.
McCarthy, Alfred F., 262,961, Cl. D13-23.000.

AB Karlshamns Plastindustri: *See—*
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Abe, Yoichi; and Matsumoto, Hajime, to Toybox Corporation. Toy pendant. 262,982, 2-9-82, Cl. D21-177.000.

Adams Hard-Facing Company, Inc.: *See—*
Ronck, Norvel J.; and Wetmore, Halsey J., II, 262,972, Cl. D15-11.000.

Ajax Industries, Inc.: *See—*
Poole, Benjamin C., 262,921, Cl. D6-4.000.

American Standard Inc.: *See—*
Stairs, Henry M., Jr., 262,989, Cl. D23-65.000.

AMF Incorporated: *See—*
Howe, John G., 262,983, Cl. D21-212.000.

Anderson, Richard W.; and Bottner, Alfred I., to GTE Products Corporation. Housing for an automatic telephone alarm system. 262,964, 2-9-82, Cl. D14-59.000.

Aqua Magnetics, Inc.: *See—*
Carpenter, Roland K., 262,987, Cl. D23-3.000.

Asakura, Kunihiko: *See—*
Fujiyama, Yoshiyuki; and Asakura, Kunihiko, 262,967, Cl. D14-94.000.

Baldwin, Linsley E.: *See—*
Campbell, C. John; and Baldwin, Linsley E., 262,974, Cl. D34-24.000.

Barsanti, Stephen. Clock. 262,947, 2-9-82, Cl. D10-6.000.

Bemis Manufacturing Company: *See—*
Rickmeir, Carl H., 262,996, Cl. D24-56.000.

Bendix Corporation, The: *See—*
Orr, Russell E., II, 262,950, Cl. D10-46.000.

Birtcil, Fred R. Latch hook. 262,920, 2-9-82, Cl. D3-18.000.

Bogner, Max; and Grun, Larry. Finger ring or similar article. 262,953, 2-9-82, Cl. D11-38.000.

Bottner, Alfred I.: *See—*
Anderson, Richard W.; and Bottner, Alfred I., 262,964, Cl. D14-59.000.

Braun Espanola, S.A.: *See—*
Garriga, Juan A. G., 262,975, Cl. D15-100.000.

Broilliard, Bernard. Refill container for pasty substance dispenser or similar article. 262,923, 2-9-82, Cl. D6-95.000.

Broyhill Furniture Industries, Inc.: *See—*
Smith, Melbourne F., Jr., 262,927, Cl. D6-153.000.

Campbell, C. John; and Baldwin, Linsley E., to Campbell Supply Co. Cart for a portable power washing unit or similar article. 262,974, 2-9-82, Cl. D34-24.000.

Campbell Supply Co.: *See—*
Campbell, C. John; and Baldwin, Linsley E., 262,974, Cl. D34-24.000.

Canada Cycle and Motor Company Limited: *See—*
Cox, Malcolm F., Jr., 262,986, Cl. D21-225.000.

Carpenter, Roland K., to Aqua Magnetics, Inc. Magnetic water conditioner. 262,987, 2-9-82, Cl. D23-3.000.

Cheung, Kwok K.: *See—*
Tong, King C., 263,003, Cl. D28-78.000.

Clairol Incorporated: *See—*
Wistrand, John, 263,001, Cl. D28-13.000.

Commisso, Nicholas D., to Mobil Oil Corporation. Packaging container for food or the like. 262,944, 2-9-82, Cl. D9-347.000.

Corning Glass Works: *See—*
LeVan, Kenneth R., 262,931, Cl. D7-3.000.

Cowan, Arnold A., to Interpart Corporation. Shock absorber. 262,959, 2-9-82, Cl. D12-159.000.

Cox, Malcolm F., Jr., to Canada Cycle and Motor Company Limited. Ice skate. 262,986, 2-9-82, Cl. D21-225.000.

Crane, Douglas L. Coal stove. 262,993, 2-9-82, Cl. D23-97.000.

Daenen, Robert H. C. M., to Dart Industries Inc. Closure for a bowl or the like. 262,932, 2-9-82, Cl. D7-40.000.

Dart Industries Inc.: *See—*
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Gaba, Rodolfo; Garland, David C.; and Pacek, James L., 262,995, Cl. D24-31.000.

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Robinson, George D., Jr.; Lacivita, Angelo M.; Day, Robert T., Jr.; and Keane, Charles C., 262,971, Cl. D15-9.200.

DiPisa, Joseph A., Sr., to Puritan Industries. Collapsible dispensing tube. 262,942, 2-9-82, Cl. D9-302.000.

Duskin Franchise Kabushiki: *See—*
Nishiyama, Masanobu; Yamamoto, Yosuke; Murakami, Toshikazu; and Tanaka, Hisaji, 262,936, Cl. D32-40.000.

Enduro Corporation: *See—*
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Envirotech Corporation: *See—*
Griffin, John; and Hatch, T. Daryl, 262,973, Cl. D15-21.000.

Event Systems, Inc.: *See—*
Holler, Frederick W., Jr.; and Wiedeman, Donald R., 262,994, Cl. D24-8.000.

Ferris, Ethel A. Materials and tools organizer for arts and crafts. 262,977, 2-9-82, Cl. D19-75.000.

Fleischmann, Gary A.; and Peabody, Lawrence C., to Kohler Co. Combined toothbrush and tumbler holder. 262,922, 2-9-82, Cl. D6-92.000.

FN International: *See—*
Jeghers, Philippe M., 262,984, Cl. D21-217.000.

Fujiyama, Yoshiyuki; and Asakura, Kunihiko, to Matsushita Graphic Communication Systems, Inc. Facsimile transceiver. 262,967, 2-9-82, Cl. D14-94.000.

Gaba, Rodolfo; Garland, David C.; and Pacek, James L., to Dart Industries Inc. Urinary catherization preparation tray. 262,995, 2-9-82, Cl. D24-31.000.

Garland, David C.: *See—*
Gaba, Rodolfo; Garland, David C.; and Pacek, James L., 262,995, Cl. D24-31.000.

Garriga, Juan A. G., to Braun Espanola, S.A. Coffee grinder. 262,975, 2-9-82, Cl. D15-100.000.

Gestetner Limited: *See—*
Lytra, Eric K., 262,945, Cl. D9-415.000.

Gilbert & Barker Manufacturing Co., Inc.: *See—*
Robinson, George D., Jr.; Lacivita, Angelo M.; Day, Robert T., Jr.; and Keane, Charles C., 262,971, Cl. D15-9.200.

Gordon Ellis & Co.: *See—*
Rodger, Michael D. R., 262,990, Cl. D23-11.000.

Griffin, John; and Hatch, T. Daryl, to Envirotech Corporation. Mining vehicle. 262,973, 2-9-82, Cl. D15-21.000.
Gross, Clare. Grapefruit knife. 262,934, 2-9-82, Cl. D7-147.000.
Gross, Daniel. Compact case. 263,004, 2-9-82, Cl. D28-83.000.
Grun, Larry: *See—*
Bogner, Max; and Grun, Larry, 262,953, Cl. D11-38.000.
GTE Products Corporation: *See—*
Anderson, Richard W.; and Bottner, Alfred I., 262,964, Cl. D14-59.000.
Gurevitz, Bernard H. Frame for pictures and the like. 262,930, 2-9-82, Cl. D6-242.000.
Hall, Stephen: *See—*
Heritage, Robert; and Hall, Stephen, 263,000, Cl. D26-63.000.
Hanig, Harvey, to Pittway Corporation. Housing for a fire and smoke detector. 262,952, 2-9-82, Cl. D10-106.000.
Harmer, Royal J. Motorcycle enclosure. 262,957, 2-9-82, Cl. D12-156.000.
Hatch, T. Daryl: *See—*
Griffin, John; and Hatch, T. Daryl, 262,973, Cl. D15-21.000.
Heritage, Robert; and Hall, Stephen, to Rotaflex (Great Britain) Limited. Spotlight fitting. 263,000, 2-9-82, Cl. D26-63.000.
Hiraki, Takayuki, to Pioneer Kabushiki Kaisha. Video disc player. 262,963, 2-9-82, Cl. D14-1.000.
Holler, Frederick W., Jr.; and Wiedeman, Donald R., to Event Systems, Inc. Penile tumescence monitor. 262,994, 2-9-82, Cl. D24-8.000.
Howe, John G., to AMF Incorporated. Tennis racket frame. 262,983, 2-9-82, Cl. D21-212.000.
Howes, Peter, to Lucas Industries Limited. Fuel injection nozzle. 262,969, 2-9-82, Cl. D15-5.000.
Hutcheson, Claude H., to Xerox Corporation. Media converter unit for a floppy disc for data processing display system. 262,968, 2-9-82, Cl. D14-107.000.
Huthmann, Heinz-Max, to J. A. Henckels-Zwillingswerk Aktiengesellschaft. Scissors. 262,937, 2-9-82, Cl. D8-57.000.
IMI Santon Limited: *See—*
Owen, William G. S., 262,991, Cl. D23-86.000.
Owen, William G. S., 262,992, Cl. D23-86.000.
Interdica S.A.: *See—*
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85 D 4,315,128
99 4,315,129
121 EB 4,315,131
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486 4,315,140
505 4,315,141
511 4,315,142
523 4,315,143

**CLASS 220**

4 F 4,314,649
23.83 4,314,650
326 4,314,651

**CLASS 222**

1 4,314,652
41 4,314,653
83 4,314,654
146 HE 4,314,655
153 4,314,656
162 4,314,657
213 4,314,658
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**CLASS 228**

140 4,314,660
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**CLASS 233**

26 4,314,662
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92 C 4,315,144
382 4,315,247
493 4,315,145

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501 4,314,964

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**CLASS 297**

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322 4,314,734

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132 4,315,196

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**CLASS 323**

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309 4,315,216
434 4,315,217

**CLASS 328**

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**CLASS 330**

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**CLASS 331**

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193 4,315,228
216 4,315,229
227 4,315,230

**CLASS 335**

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**CLASS 336**

90 4,315,232

**CLASS 337**

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308 4,315,239

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146.3 D 4,315,246
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347 AD 4,315,255
347 CC 4,315,253
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347 P 4,315,252
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723 4,315,257
784 4,315,258
799 4,315,259
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**CLASS 343**

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797 4,315,264
840 4,315,265
895 4,315,266

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17 4,315,268
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155 4,315,270

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3.66 4,314,739
96.15 4,314,740
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**CLASS 352**

130 4,314,744

**CLASS 353**

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274 4,315,299
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**CLASS 363**

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4,315,314
300 4,315,315
483 4,315,316
510 4,315,317
515 4,315,318
571 4,315,319
808 4,315,320
900 4,315,321
4,315,322
4,315,323

**CLASS 366**

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101 4,314,766
148 4,314,767
156 4,314,768

**CLASS 367**

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98 4,315,325
134 4,315,326

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66 4,315,328
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**CLASS 370**

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**CLASS 371**

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45 4,315,226

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146 4,314,880
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245 4,314,881
327 4,314,885
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441 4,314,884

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144.2 4,314,769
175 4,314,770

**CLASS 403**

305 4,314,771

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116 4,314,773

**CLASS 405**

115 4,314,774
155 4,314,775
205 4,314,776
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259 4,314,778
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**CLASS 409**

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96 4,314,781

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491 4,314,797

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88 4,314,992
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93 4,314,995
95 4,314,994
101 4,314,997
177 4,314,998
4,314,999
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4,315,001
181 4,315,002
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238 4,315,004
246 4,315,005
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309 4,315,031
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386 4,315,044

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70 4,315,074

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189 4,315,333

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71 4,315,075
77 4,315,076
4,315,077
103 4,315,078
115 4,315,079
189 4,315,080

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20 4,315,082
53 4,315,083
69 4,315,084
301 4,315,085
391 4,315,086
421 4,315,087

CLASS 526

89 4,315,089
119 4,315,090
125 4,315,088

CLASS 528

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| | 4,314,703 | | 4,315,237 | | 4,315,241 | | 4,314,466 | | 4,314,830 | | 4,314,593 |
| | 4,314,718 | | 4,315,238 | 13 : | 4,314,518 | | 4,314,510 | | 4,314,876 | | 4,314,598 |
| | 4,314,719 | | 4,315,258 | | 4,314,572 | | 4,314,560 | | 4,314,893 | | 4,314,607 |
| | 4,314,736 | | 4,315,264 | | 4,314,587 | | 4,314,635 | | 4,314,925 | | 4,314,644 |
| | 4,314,743 | | 4,315,265 | | 4,314,633 | | 4,314,722 | | 4,314,956 | | 4,314,658 |
| | 4,314,750 | | 4,315,266 | | 4,314,647 | | 4,314,733 | | 4,314,962 | | 4,314,661 |
| | 4,314,762 | | 4,315,270 | | 4,314,648 | | 4,315,164 | | 4,315,000 | | 4,314,802 |
| | 4,314,775 | | 4,315,278 | | 4,314,829 | | 4,315,197 | | 4,315,014 | | 4,314,855 |
| | 4,314,784 | | 4,315,290 | | 4,314,866 | | 4,315,228 | | 4,315,102 | | 4,314,875 |
| | 4,314,788 | | 4,315,296 | | 4,314,976 | | 4,315,243 | | 4,315,113 | | 4,314,886 |
| | 4,314,823 | | 4,315,303 | 16 : | 4,314,490 | | 4,315,315 | | 4,315,170 | | 4,314,915 |
| | 4,314,838 | | 4,315,312 | 17 : | 4,314,390 | | 4,315,321 | | 4,315,249 | | 4,314,919 |
| | 4,314,841 | | 4,315,313 | | 4,314,405 | | 4,315,330 | 27 : | 4,314,460 | | 4,314,920 |
| | 4,314,858 | | 4,315,319 | | 4,314,418 | 25 : | 4,314,474 | | 4,314,562 | | 4,314,930 |
| | 4,314,863 | | 4,315,331 | | 4,314,452 | | 4,314,483 | | 4,314,565 | | 4,314,942 |
| | 4,314,869 | 08 : | 4,314,395 | | 4,314,455 | | 4,314,547 | | 4,314,753 | | 4,314,985 |
| | 4,314,879 | | 4,314,411 | | 4,314,480 | | 4,314,550 | | 4,314,757 | | 4,314,991 |

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(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
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